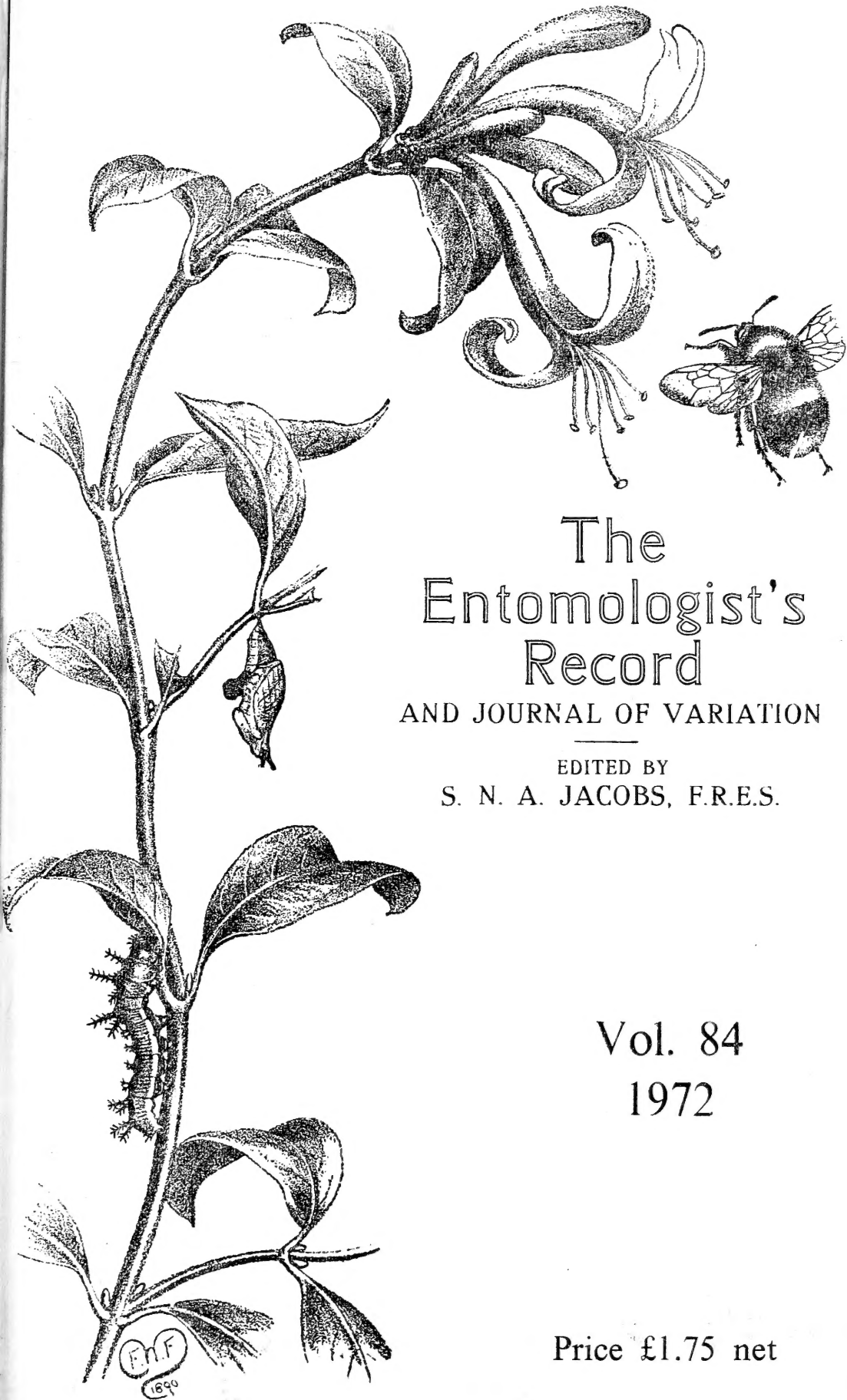


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Eumenis semele (L) *thyone* Thompson (Lep. Satyridae). A Microgeographical Race

By R. L. H. DENNIS

In a previous paper (antea 82, 1970) it was mentioned that the aspect of size of *E. semele thyone* Th. would be dealt with once representative samples of colonies had been taken in a transect along the North Wales coast. This has now been done.

To recapitulate on the situation, the following was required:—

- (1) The average size of the subspecies *thyone* Th. In my previous paper, it was mentioned that J. A. Thompson had labelled it 47.7 mm. ♂♂, 51.1 mm. ♀♀; whilst E. B. Ford had given 41 mm. ♂♂ and 43 mm. ♀♀,—an obvious discrepancy.
- (2) The nature of the cline beyond the Great Orme's Head east to Prestatyn, and west to Anglesey, in an attempt to solve the status of what E. B. Ford termed 'normal specimens.'

Sampling Procedure and Colonies

The accuracy of the results is dependent on the sampling procedures utilized, and two facets are involved.

(i) Total spatial coverage.

The initial step was to demarcate the boundary area of each *semele* colony. These generally followed two patterns. Those colonies at Rhyd-y-Foel, Nant-y-Gamar, Moel Hiraddog, Aber Valley and Bwrdd Arthur, were extremely restricted in areal extension, being limited to precipitous escarpment faces and steep slopes. However, sheep tracks and exposed bedding along rock outcrops, afforded a means of covering each area along the line of the escarpments, and continual transects were taken, steadily covering the vertical face.

The remaining colonies were far more extensive (800 × 200 yds), but were usually represented by a more horizontal surface. At Prestatyn, Aberffraw and Conway Morfa, the linear pattern of the dunes was followed, and the examples taken accordingly. The Great Orme was divided into 100 subdivisions for each grid square, on a map scale 1:2,500; transects were effected in late June 1970 covering the entire headland, and the detailed distribution of *E. semele* and *P. argus* mapped. It must be borne in mind that Figure 1 is a reduced scale version for this Journal, and as such, a loss in accuracy must be expected. Sampling transects were made along the whole west sector of the Great Orme covering each vertical rise at every arbitrarily noted return point.

(ii) Temporal coverage.

Sampling throughout the flight period was not carried out to the same extent, for the obvious reason of the limited available time. The eleven stations have been sampled over the past three years. It became apparent during the work that the

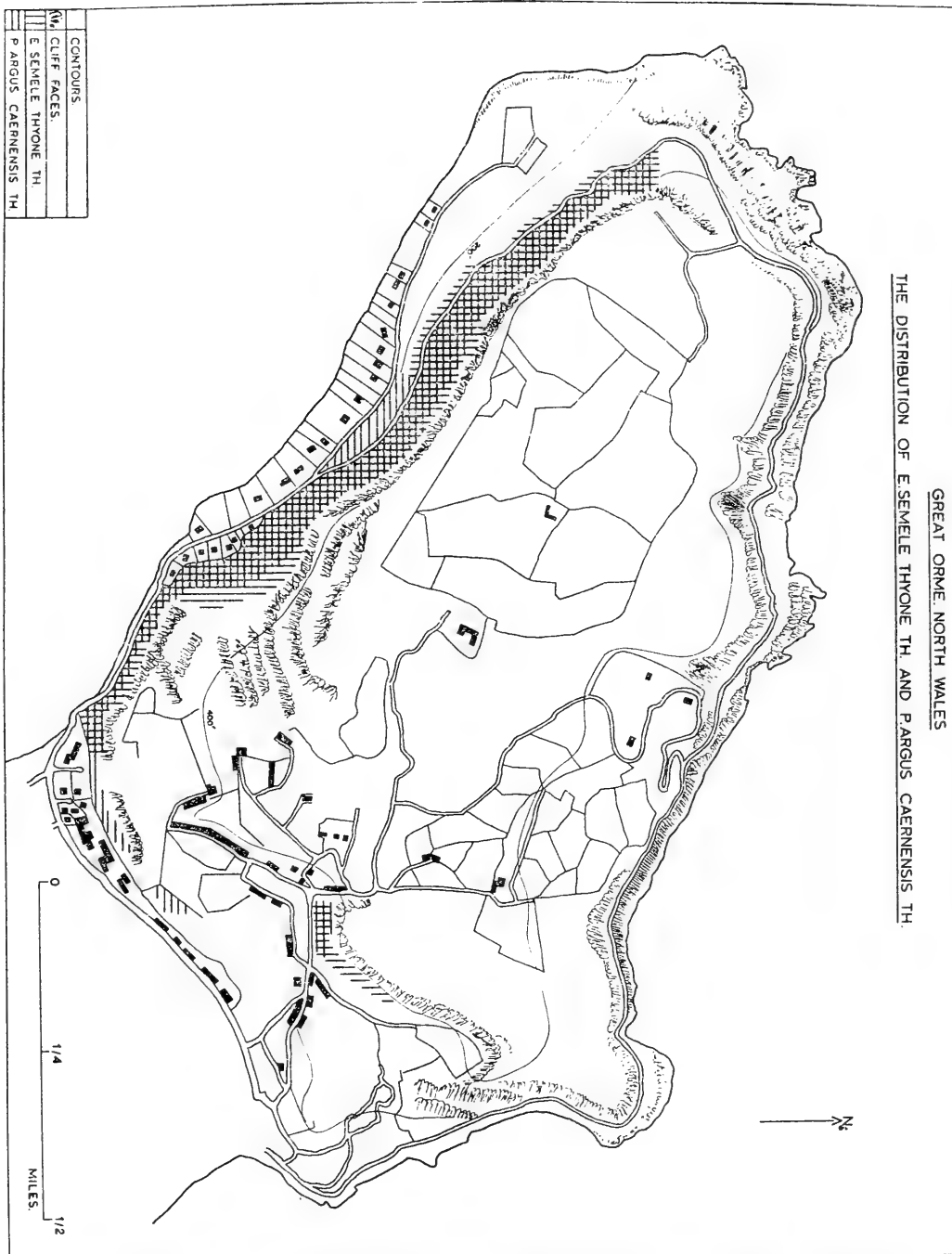


FIG. 1.

size of the *semele* populations varied little from one year to the next in all the inlying stations.

More than twenty sampling days were spent collecting on the Great Orme, and over ten days at colonies between Conway Mountain and Rhyd-y-Foel, with only two days spent at each of the outlying station, where samples were taken during the mid-emergence period of both sexes. The inlying stations were sampled throughout the flight period indicated in Figure 2. The writer could not be in North Wales prior to the 18th June each year, and so *thyone* was not sampled in its early flight

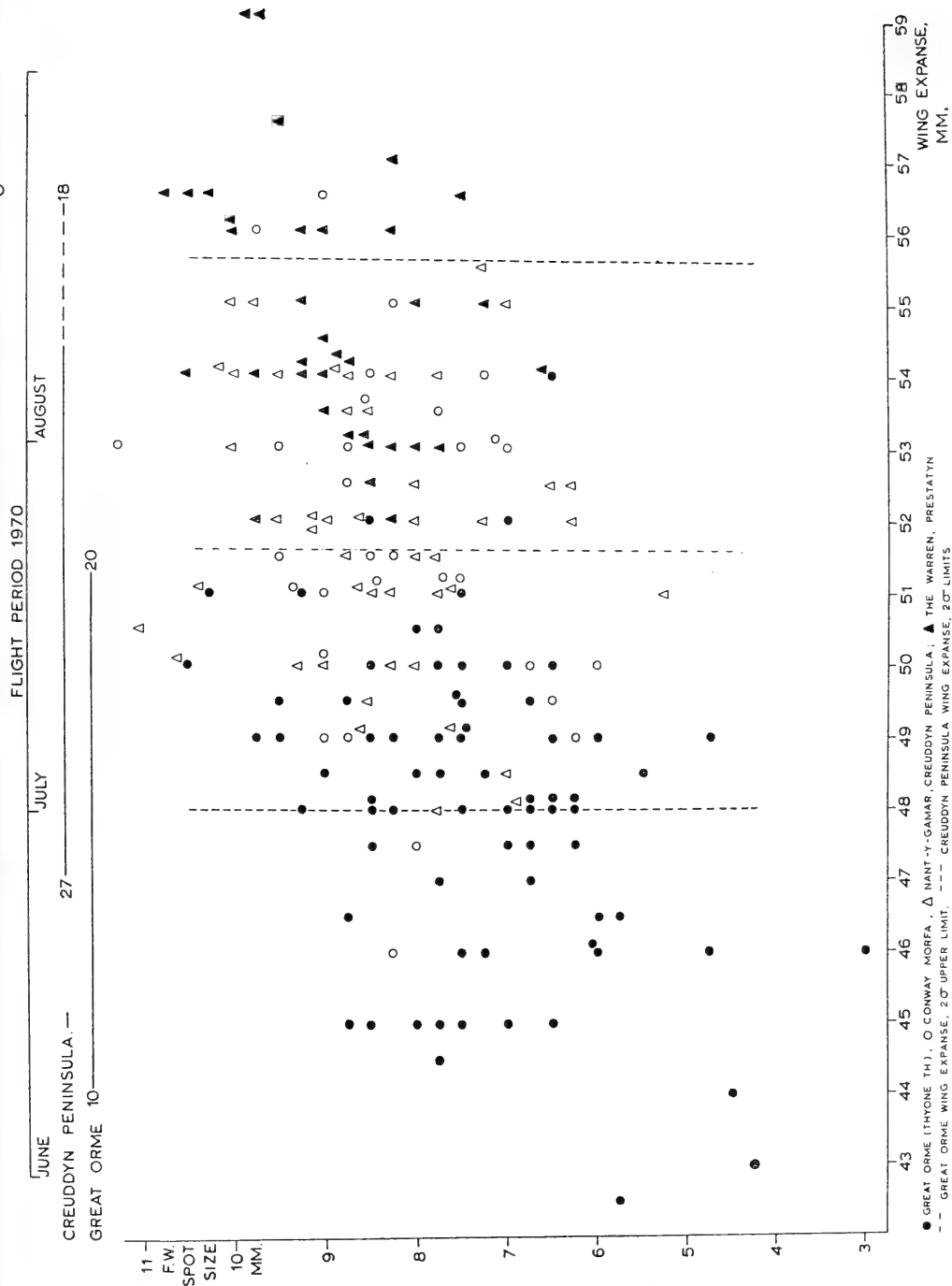


FIG.2.

period. The date for its emergence is that provided by H. N. Michaelis for 1970.

The final facet of the samples, the actual number of insects utilized, is of course very important. At first, it was assumed necessary to obtain 50 specimens of each sex from each locality, but it was found that stabilisation of the mean began after 15 insects and was attained with a standard error (S.E.) 0.2 to 0.4 mm. at 25-30 specimens. For instance, the Rhyd-y-

Foel ♂♂ of 13 insects in 1970, had a mean value of 51.3 mm. (S.E. 0.57 mm.); with 32 insects (1971), the mean was still 51.3 mm. Details of the sample figures are given below:—

TABLE 1

Localities	Trearddur Bay	Bwrdd Arthur	Aberffraw	Aber Valley	Conway Mt.	Conway Morfa	Nant-y-Gamar	Gt. Orme	Rhyd-y-Foel	Moel Hiraddog	Prestatyn	Total
♂♂	12	24	55	29	76	31	47	72	32	34	36	448
♀♀	6	7	25	51	45	22	28	58	17	27	34	320
Lithology	Mica Schist	Limestone	Sand	Slate	Rhyolite	Sand	Limestone	Limestone	Limestone	Limestone	Sand	

The Cline and Delimitation of the Microgeographical Race.

The means of all the populations sampled are given in Figures 3 and 4. It can be seen at once, that the figures for the Great Orme approximate very closely to those given by J. A. Thomson (1944) (48.01 mm ♂♂, 51.7 mm ♀♀). It would appear instantly that E. B. Ford's figures are anomalous, but the difference here is in the manner of measurement. It would appear that G. Thomson and the writer take measurements from the centre of the thorax to the apex, doubling the figure; while E. B. Ford relies on a direct wing expanse measurement from apex to apex. I have certified this by taking measurements using both methods. It is important that the method of measurement is entered with articles). I have G. Thomson to thank for pointing out this dualism. It is preferable to follow the method used here and in G. Thomson's work on *M. jurtina*; as the wing expanse procedure is dependent on the setting whims and ability of the individual.

Isophenes (Figures 3 and 4) have been placed at right angles to the clinal change. It is however, important to bear in mind certain points concerning the isophenes. They have been used here as a discriminate measure between populations, and it is readily noticed that they are correct on the basis of the sampling points entered alone. For instance, on introducing certain sampling points to the south of the Creuddyn Penin-

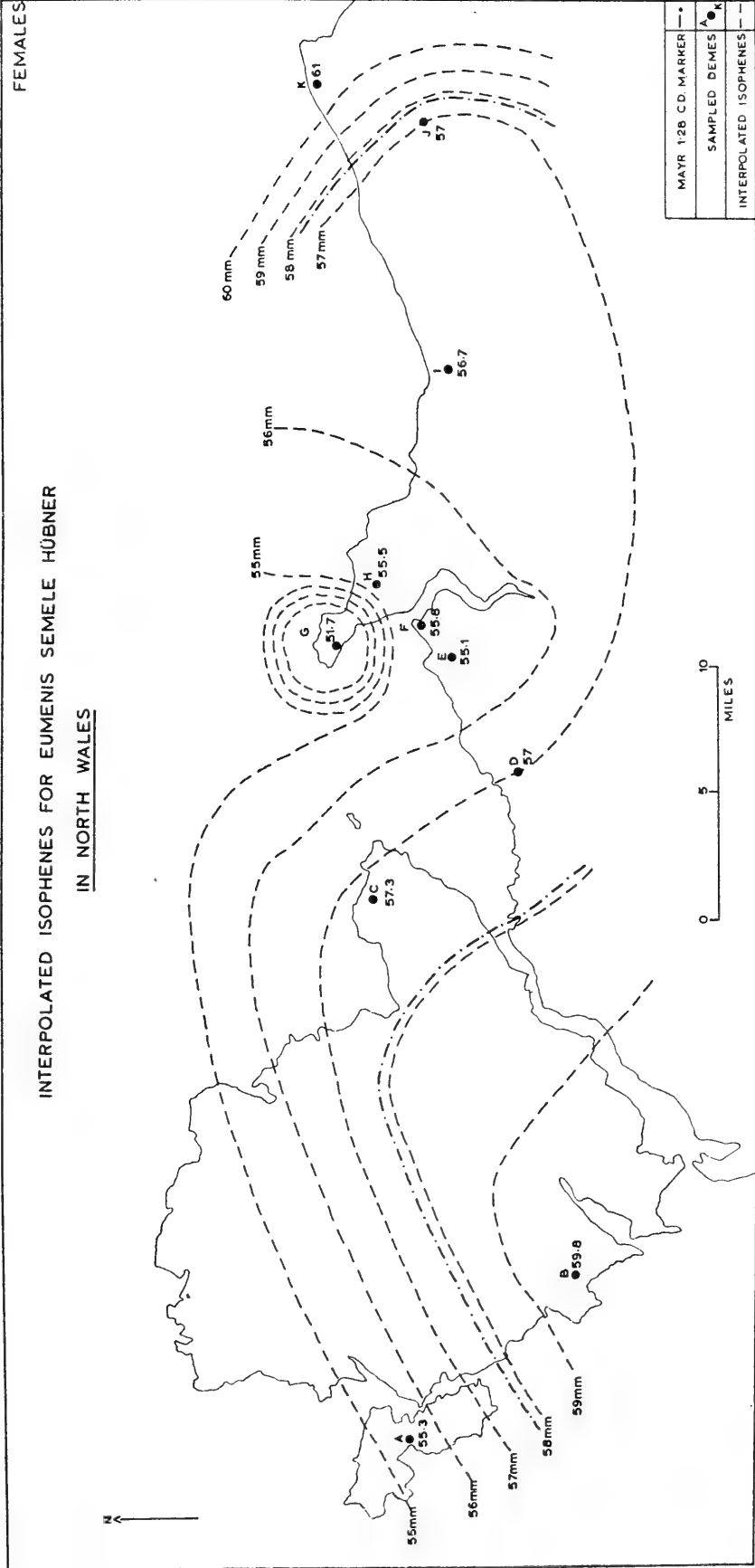


FIG.3.

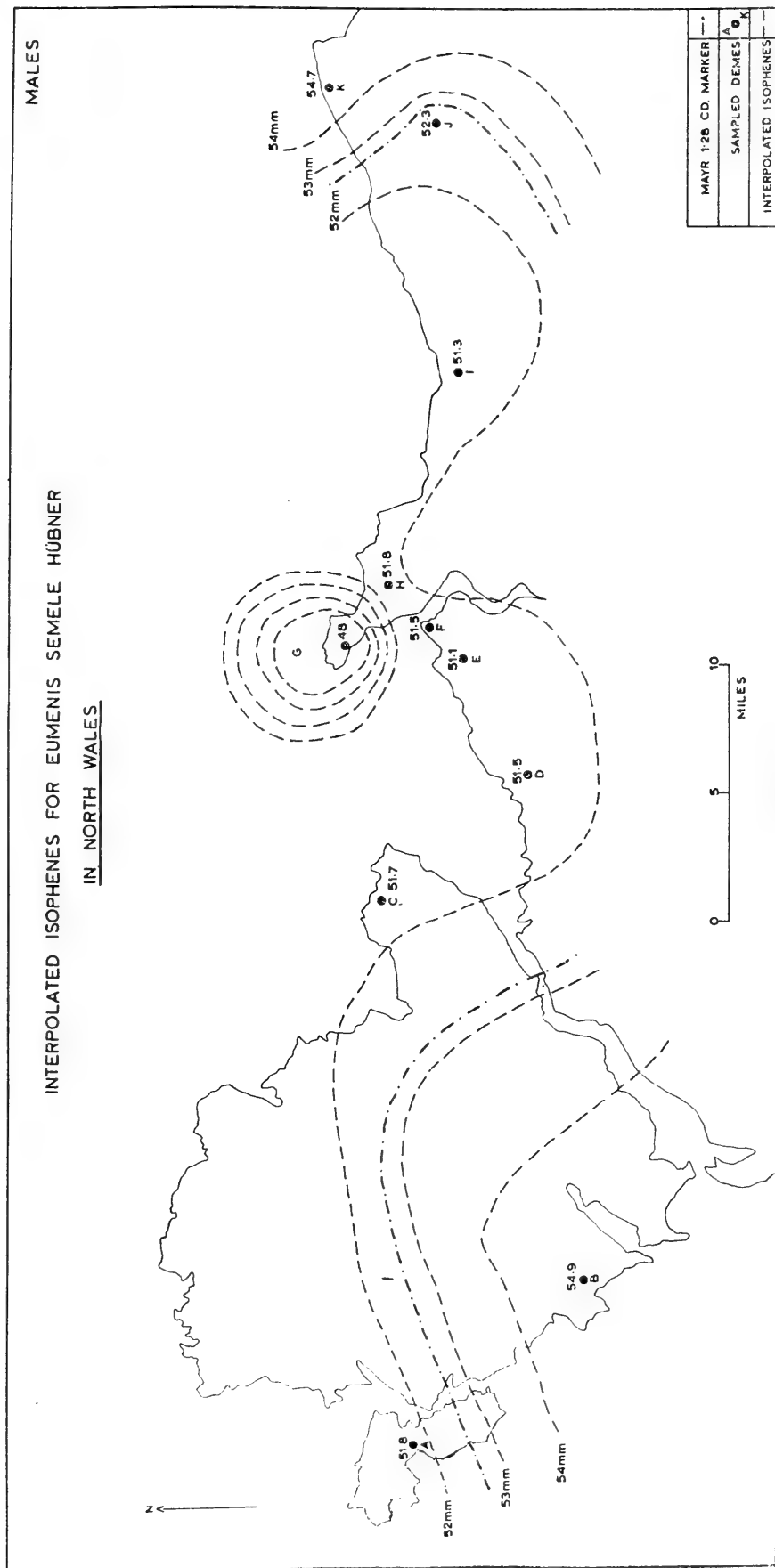


FIG.4.

sula, west of the Aber Valley, and in Anglesey or Flintshire, these lines may well have to be altered. In reality, of course, there is no gradual change between the Great Orme and Nant-y-Gamar (or any other demes), but a sudden break established by Llandudno; in fact it is more correct to assume that no colony exists between presently marked demes, until they have been recorded.

However, the isophenes are valuable in one respect. As a distant measure, they give an appreciable visual impact of the differences between the *semele* populations. Two features are of importance:—

- A. The marked clustering of the isophenes at three points indicate a sudden break in the *semele* populations.
- B. A wide area of general uniformity representing either gradual change in the *semele* populations as to size, or a general stabilization about a certain figure oscillating in respect of environmental conditions.

(AI) *The Great Orme thyone Th. Population*

This break is extremely marked. The great Orme ♂♂ are differentiated from the Nant-y-Gamar ♂♂ ($X^2_{(3)} 60.6$, $P < 0.001$) and the Conway Morfa ♂♂ ($X^2_{(3)} 118.9$, $P < 0.001$), the two adjacent populations on a highly significant basis. The difference may appear to be not so great in the females (Great Orme v. Nant-y-Gamar ♀♀ $X^2_{(3)} 34.04$, $P < 0.001$) this being the result of the small numbers used in the Creuddyn sample, but the Chi figure is still highly significant. The area of the subspecies is delimited to the west side of the Great Orme (Figure I), yet the population is not totally isolated from contiguous populations; certain gene flow perhaps increased by anemochore dispersal, implicated by prevailing westerlies, obtains between Conway Morfa *semele*, Llandudno West shore *semele*, and Great Orme *thyone*. It is obvious even in face of population contiguity, soon to be broken, that the limestone-sand dune interface representing the environmental break between *thyone* Th. and the Creuddyn Peninsula populations is a real one, and though perhaps not providing the reason for the racial differentiation is however a basis for it. In more specific terms, it is not an inherent quality of the limestone, nor possibly a major environmental facet of it that provides a selective pressure on the *thyone* population; yet whatever, there is an association of some selective facet with the headland.

It was deemed important to assess the degree of differentiation between the Great Orme population and those contiguous members to it, and those along the whole transect. For this purpose, a corollary of the 75% distance rule was applied, Mayr's coefficient of difference. This statistic relates the difference of the means to a summation of the standard

deviations (in this case σ):—

$$CD = \frac{xb - xa}{\sigma a + \sigma b}$$

When the value approaches 1.28, it is a marker of the 75% rule. (According to this, a subspecies is recognised if 75% of the individuals of one population differ from all (97%) of a recognised subspecies, in this case nominotypical *semele*.) Mayr points out, however, that even values of CD 1.5 are demanded by some authorities for subspecific differentiation.

Using the above relationship, the following was noted:—

Great Orme v. Nant-y-Gamar.	♂♂	CD 1.03
Great Orme v. Nant-y-Gamar.	♀♀	CD 0.82
Great Orme v. Prestatyn.	♂♂	CD 1.8
Great Orme v. Prestatyn.	♀♀	CD 1.9

There is, however, a problem. If size alone is being compared, what wing expanse value represents the normal subspecies, if indeed such exists? It will be seen in a following section that in the south of Britain, the insects are more akin to the size of specimens at Prestatyn, and not as small as those at Moel Hiraddog. There is a strong environmental operative, since similar sized insects as those from the uniform area over most of North Wales (♂♂ 51.52 mm, ♀♀ 55.57 mm) are found in many localities in N.W. England. (Manchester Museum specimens.)

However, deriving for a CD value of 1.28 for the *thyone* population, the nominotypical *semele* would have to be 52.6 mm (1.8 σ) ♂♂, and 57.84 mm (2.4 σ) ♀♀; at this level, the subspecific category is determined by the 75% marker.

(A2) *The Sand Dune Populations*

It is apparent that the end member populations of the cline are associated with a sand dune environment. Their large size may well be attributed to ecophenotypic variation. Whatever, they differ significantly from adjacent populations:—

Moel Hiraddog v. Prestatyn.	♂♂	$X^2_{(3)}$	20.12, $P < 0.001$
Bwrdd Arthur v. Aberffraw.	♂♂	$X^2_{(3)}$	27.23, $P < 0.001$
Moel Hiraddog v. Prestatyn.	♀♀	$X^2_{(3)}$	29.06, $P < 0.001$

This difference is most likely associated with selection operating towards one end of a continuously variable sequence determined by polygenic factors, for which size is a pleiotropic secondary effect. It is interesting to compare the Conway Morfa figures, which should bearing in mind the environmental relationship approximate the measurement characteristics of Prestatyn and Aberffraw *semele*; that this does not occur, reflects on the clinal situation in the vicinity of the Great Orme, and is an essential feature in determining the subspecific attributes of *thyone* Th.

(B) *The Uniformly Belt of semele along the N. Wales Coast.*

Beyond the Great Orme geotype, and inside the sand dune extremes, uniform *semele* measurements are a remarkable feature ($\sigma\sigma$ 51.1-52.3; $\eta\eta$ 55.1-57.3 mm). The greater range noticed in the females is related to their correspondingly higher standard deviations. The interesting point is that these measurements are associated with five lithological environments. If it assumed that the sand dune *semele* demes are related to environmental pressures producing higher figures, and that outside Conway Morfa the *semele* populations are not affected either by gene flow from the Great Orme, nor under selective pressures approaching those of the Great Orme, then, the uniform type along the N. Wales coast is indifferent to the Great Orme population, and its size characteristics are endemic to the region. It would have an overall mean of $\sigma\sigma$ 51.6mm and $\eta\eta$ 56.2mm. As then they would represent the environmental equivalent of the nomino-typical *semele* (especially as the majority are on limestone), the Mayr CD. 1.28 marker is too high to endow true subspecific status on *E. semele thyone* Th. However, it and *P. argus caernensis* Th. are microgeographical races.

In view of the above, and in attempt to provide some comparison, the writer was fortunate enough to have access to Manchester Museum *semele*. Measurements were obtained of *semele* from Winterton (Lincs/Norfolk?), south east localities (Eastbourne, Folkestone), and from the Isle of Man. As only a small number of specimens were available, these measurements can only indicate broad trends. The Winterton (20) and south east *semele* (24) were remarkably homogeneous. ($\sigma\sigma$ 54.8 mm/54.6; $\eta\eta$ 59.8 mm). It was surprising to find such small female figures with the large male measurements, but this could very well be attributed to the small samples available. It is perhaps a certain feature of the south east that *semele* is large, and this is a definite trend on the Continent. The writer has been sent specimens from La Mare, Vendée, and from Champigny, Maine et Loire, that are indicators of this trend; ($\sigma\sigma$ 15, 57.6 mm; $\eta\eta$ 11, 64.1 mm) those from the east Pyrnees are even more extreme, or so it would appear. ($\sigma\sigma$ 6, 60.1 mm; $\eta\eta$ 6, 67.2 mm). It would be very interesting to assess the factors behind these changes, yet, it is not wise to ascribe them to major environmental changes such as alterations in heat, load or insolation without experimental evidence. Finally, it was interesting to find that a short series of $\sigma\sigma$ *semele* from the Isle of Man measured 51.6 mm, exactly the N. Wales average given above. These specimens, and others from inland Lancashire corroborated the North Wales uniform type to be unaffected by *thyone* Th. or similar genetic endowments for dwarfed insects.

Spot Size Differences in North Wales E. semele

As this paper is concerned with meristic variation in *E.*

semele, the difference in spot size between *thyone* and other populations can be dealt with here.

J. A. Thompson pointed out in his original description:—
♂♂ "The forewing spots are smaller than in other races, with the lower of the two frequently absent, and totally obsolescent specimens are not very rare". . . . "The tendency to obsolescence is even more striking on the undersurface than on the upperside."

♀♀ "obsolescence is less marked, although the spots are smaller than in normal specimens."

Initially, it must be pointed out that obsolescent specimens have not been seen in the past three years. In fact, of the 73 ♂♂ specimens taken at random, only one displays the absence of a single forewing underside spot. Yet, 1 ♂ and 11 ♀♀ have an extra spot. It seems extremely likely, that at the time J. A. Thompson was collecting, the Great Orme population was extremely abundant, — he describes the butterfly as being in 'immense profusion'—and variable. This variability apparently extended the trend of obsolescence in the forewing spotting. Such periods of variability have been dealt with in detail by Professor E. B. Ford (1964).

It was important to ascertain whether or not J. A. Thompson was correct in his judgement of the reduction of the forewing spots, and to assess the nature of any changes in the population since 1944. It may be stated now, that the only apparent change is that the insect is less abundant—it is common but not in profusion—and less variable.

The two forewing underside and two forewing upperside spots have been measured interneurally for each specimen, and the means of certain populations have been given below:—

TABLE 2

♂♂	7.3	8.4	8.2	8.9 mm
♀♀	9.7	11.2	11.4	12.1 mm

GT. ORME
NANT-Y-GAMAR
CONWAY MORFA
PRESTATYN

Composite FW. UP. and UN.
spots measured interneurally,
via proximal—distal attitude.

As the results for each population approximate a gaussian relationship, a t. test was applied, and established the following differences:—

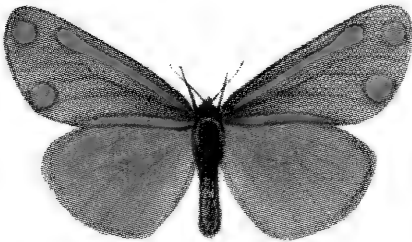
Great Orme v. Nant-y-Gamar. ♂♂ t (117)=4.6, P<0.001
Great Orme v. Conway Morfa. ♂♂ t (101)=3.4, P<0.001
Great Orme v. Nant-y-Gamar, ♀♀ t (84)=4.3, P<0.001
Great Orme v. Conway Morfa. ♀♀ t (78)=5.07, P<0.001



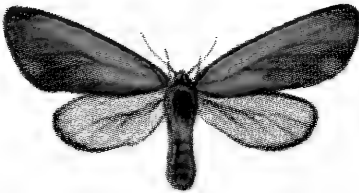
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2



3



4



From the original watercolour drawing by A. D. A. Russwurm.

Aberrations of *Callimorpha jacobaeae* L.

- | | |
|------------------------------------|--|
| 1. ab. <i>transparens</i> Watson ♂ | 3. ab. <i>inversa</i> Watson ♀ |
| 2. ab. <i>albescens</i> Cockayne ♂ | 4. <i>sinis.</i> ab. <i>coneyi</i> Watson dex. typical ♂ |

These statistical facts convey an irrevocable message, that J. A. Thompson's judgment was correct. The differences expressed statistically above are given in detail for the males in Figure 2. The gradation of the forewing spot measurements no doubt follows closely that of the wing expanse measurements, and the dispersion diagram (Figure 2) reveals this relationship.

(To be continued)

Further Aberrations of *Callimorpha jacobæae* Linn. (Lep. Arctiidae)

By R. W. WATSON, F.B.A.A., F.F.A.A., F.C.I.S., F.COMM.A., F.R.E.S.

Callimorpha jacobæae ab. *transparens* ab. nov.

Fore- and hindwings of normal pattern but so thinly scaled that the colour is only just visible.

Thorax and abdomen dull black.

Type ♂ bred Wootton, New Forest, June 1945, R. W. Watson.

Watson Collection.

Callimorpha jacobæae ab. *albescens* Cockayne

Originally described *Ent. Record*, **63**: 263, 1951: "The forewing is pale silvery grey with slightly darker fringe and normal red markings. The hindwing is red with a silvery grey border and fringe. The thorax is dark grey and the abdomen is pale grey. Type male Loc. incog. bred Meek 1875 (S. Webb, Horne Coll.) R. Adkin coll. Allotype female Woodchester Glos. 18.5.1920, L. Lacey. This is a beautiful albino.—E.A.C."

The specimen depicted herewith is a male labelled "Witley Sy. June 1911, Eastwood." It was purchased for 5/- at the auction sale of 10.11.1967, and reset by R. R. Watson.

Watson Collection.

Callimorpha jacobæae ab. *inversa* ab. nov.

Forewings dull pink except for small blackish grey tips and a dull grey patch extending from the outer margin half way to the basal area on the lower half of the wing only. Fringes dull blackish grey. Thinly scaled.

Hindwings dingy white with blackish grey fringes. Also thinly scaled.

Thorax and abdomen dull pink suffused with blackish grey. Type, ♂ bred ex *coneyi* stock June 1969. R. W. and R. B. Watson.

Watson Collection.

Callimorpha jacobæae, Somatic mosaic.

Sinis. ab. *coneyi* Watson, *dex.* typical.

♂ bred June 1968 by A. W. Coney ex *coneyi* stock.

Watson Collection.

Callimorpha jacobaeae ab. *basirubra* ab. nov.

Forewings typical except for red scaling in the basal area between the costal and lower red streaks.

Hindwings typical.

Thorax and abdomen black with red suffusion.

Type, ♂ bred June 1969, Origin wild male from Bordon, Hants. × *coneyi* female. R. W. and R. B. Watson.

Watson Collection.

Paratypes 7♂♂ and 15♀♀ from same brood. Watson collection.

This is the most beautiful of the aberrations so far described. The amount of red varies from a relatively small area increasing in some extreme examples until the inner two thirds of the wing are affected. In all cases the outer third of the wing is typical. This aberration only occurred in the aforementioned brood in 1969. Females from this brood were paired with typical males ex *coneyi* stock and this aberration occurred again in 1970. In 1971 further *basirubra* emerged from pairing between a wild male from Portland, Dorset, and a *coneyi* female.

Acknowledgements

A. D. A. Russwurm: His excellent work continues.

Mrs R. B. Watson, F.R.E.S. Without her assistance, breeding on the required scale would have been impossible.

A. W. Coney for donating the somatic mosaic.

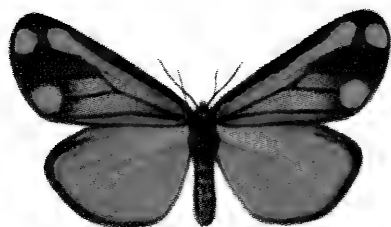
Porcorum, Sandy Down, Boldre, Lymington, Hants.
November 1971.

The Burren, May 1971

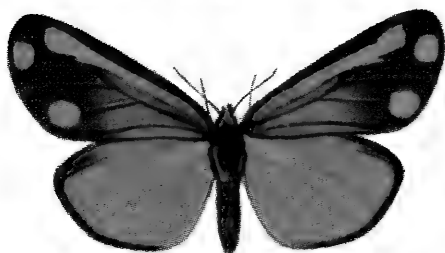
By E. A. SADLER

After many years impatiently awaiting a chance to visit that unique area known as The Burren of Co. Clare, I was delighted to find such an opportunity in May this year, when modernisation of my work at last allowed me to get there, and though my friends Peter Rogers and Pat Meredith, hereafter referred to as R. and M. respectively, who accompanied me on this venture would rather have made the visit in June, I was forced to confine it to the last week in May, which we hoped, considering the earlier than usual spring, would give us a fair chance of seeing the lepidoptera we were going for.

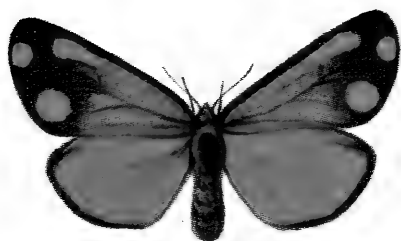
R. and I drove to Bristol airport on the 20th for our first taste of civilian air travel, both having only previously been up by courtesy of the Royal Air Force. The baggage arrangements as far as we understood were the first 40 lbs. free, and an excess charge of so much per pound. Having weighed my luggage (which included a Honda generator) before setting out, I knew it went about one hundredweight, and was far from happy at the thought of what it would cost. R., whose baggage was heavier than mine, also approached the weigh-in with some trepidation. But we need not have worried, as



1



2



3



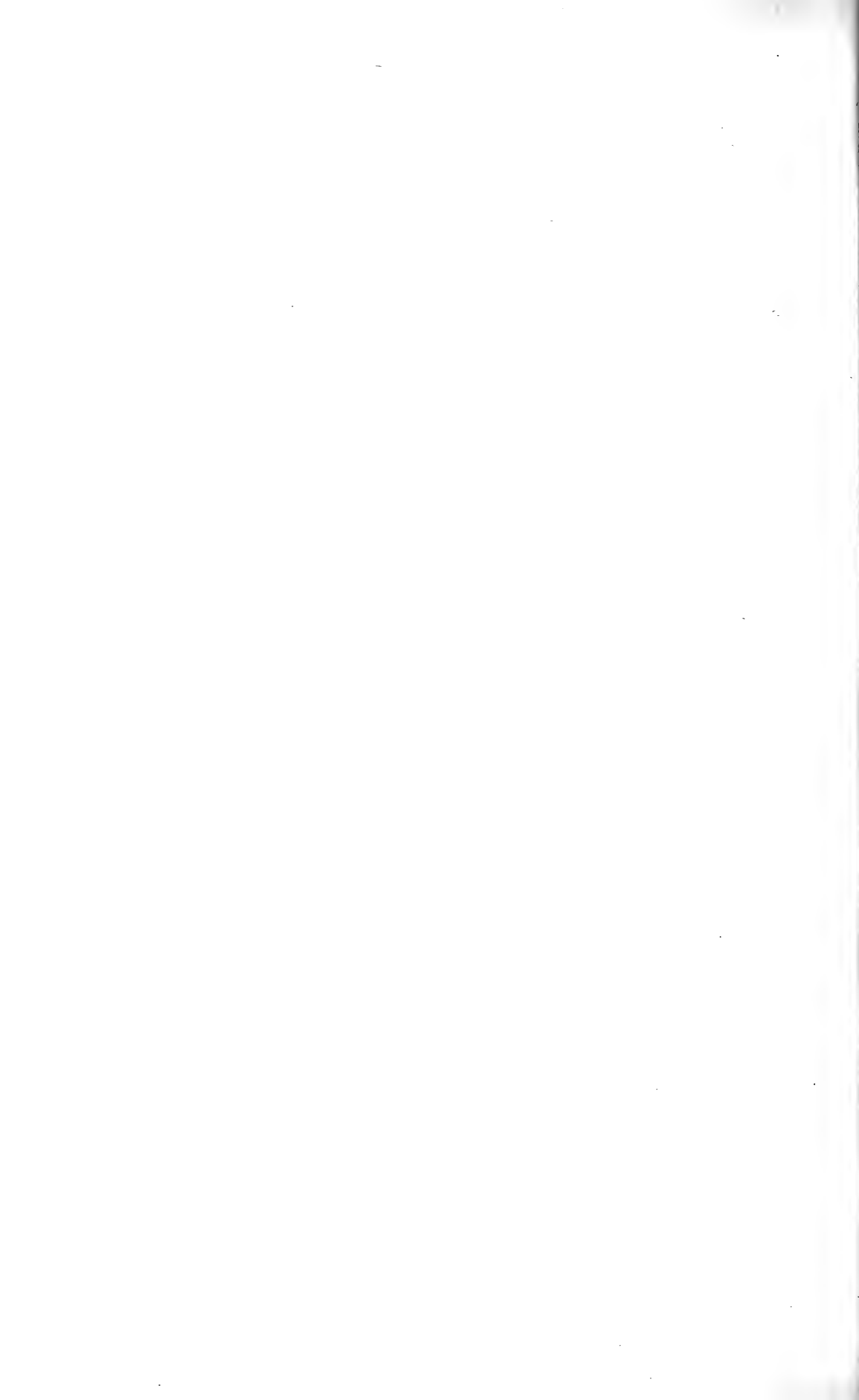
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From the original watercolour drawing by A. D. A. Russwurm.

Aberrations of *Callimorpha jacobaeae* L.

1 and 2. ab. *basirubra* Watson ♂♂

3 and 4. ab. *basirubra* Watson ♀♀



all our 2 cwt. plus was accepted without question, and conveyed free of charge. An unexpected difficulty did arise, however, when our flight, scheduled for 12.30 was delayed until 14.15, when we at last took off for Cardiff in a Boeing 727, where we touched down briefly before resuming our journey to the Emerald Isle, or, more precisely, Dublin airport, arriving there at 15.00 hours.

Due to the delay, we were now running a bit behind our schedule, so to save time, R. went to collect the car, which incidentally, is made available by the Irish Tourist Board free to any two people spending a week there in the off season, while I was left to shepherd our mound of baggage past the customs. The junior officer, taking one look, called reinforcements in the shape of a senior colleague who rather disarmingly started my interrogation with: "You seem to have rather a lot of luggage, sir?" but after my brief explanation, I was allowed through, classified as a harmless idiot if I read the smiles on both their faces correctly.

We were pleased to find that the car awaiting us was not a Mini as we had been led to believe, but a new Hillman Avenger, which meant there was more space than anticipated for our gear, and we crossed Ireland in comfort. I was interested to see how deserted were the main roads once we got out of Dublin. This coupled with the fact that until we neared our destination, they were very wide, meant that we suffered no hold-ups and made good time, arriving in the Burren area just before 7 p.m.

Ballyvaughan was our first port of call, and we drove to a small cottage along the coast road where R. on a previous visit had obtained permission to plug in a m.v. trap; we were kindly granted the same facility so we speedily ran out the cable and erected a portable trap R. had brought with him, on the corner of what passes for a field in this region, for, apart from the walls around the pavement-like ground with sparse grasses growing in the crevices, they bear little resemblance to the lush pastures of home. I wondered what our herd of 200 dairy cows would make of such spartan surroundings; I am certain that those that did not immediately break legs would only have died of starvation, yet cows and donkeys, in admittedly small numbers, were looking amazingly healthy in such fields.

With the trap in position and an assurance from our obliging host that he would switch on each evening at dusk, we resumed our journey to Lisdoonvarna, where our hotel accommodation had been arranged, crossing the Burren completely to do so, which gave me a good idea of the terrain we were to work during the coming days. Apart from the numerous stone walls, the hawthorn bushes everywhere with their masses of white blossom were the most eye-catching feature at this season of the year. I noted that though higher parts of the ab. *rustica* form of *Cynia mendica* Clerk, which we shared.

looked grey and bleak, there was a good deal more vegetation and trees on lower areas than I had expected from descriptions which I had read or heard, and in places some fields were virtually rock-free and grass covered.

We were well received at our hotel in Lisdoonvarna, and after a meal, we loaded our collecting gear aboard the car, and drove the few miles to Fisher Street, and nearby Doolin Strand, where along the rocky coast bordering Galway Bay, we intended running our four m.v. light from our two generators, our main quarry being *Hadena caesia* Borkh. After looking out suitable sites for the night's operations, I found there was at last time, with the sun still not down, to appreciate the natural beauty of this area, with the huge cliffs of Moher in the distance, a small rocky island, known as Crab Island, just off-shore covered in gulls assembling for roost, whilst around us were beds of the commoner flowers, bladder campion bird's foot trefoil and sea thrift, overflowing from cracks and wider faults in the rock pavement. Amongst these flowers, the undescribable bright red of bloody cranesbill caught the eye, though a good many of these were still unopened buds.

At 10 p.m. we arranged our lights along the rocky coastline, but found it was not until nearly an hour later that it became properly dark in this most westerly part of the British Isles. Soon after lighting we were pleased to get numerous deep grey coloured *Eupithecia venosata* Fab. rapidly followed by an increasing number of *Hadena capsophila* Dup., some showing by their worn state that this species (or sub-species) had not just commenced emergence even at this early date. Plenty were, however, in immaculate condition, and we soon had a series each. One *caesia* of the nice blue-grey Burren form arrived early, but we had to wait until midnight before three more arrived, to be followed an hour later by two more just as we were about to pack up. Because of this, we stayed half an hour longer, by which time, with no new moths arriving we agreed to call it a night. We were back at our hotel by 2 a.m., well pleased with our first night's work, which also produced an *Apatele euphorbiae* sub-sp. *myricae* Guen. for each of us.

After breakfast the following morning we drove to Ballyvaughan to inspect the trap, finding the intake quite respectable, consisting of a varied assortment of common species, among which we were pleased to find several *Calostygia salicata* sub-sp. *latenaria* Curtis, and I was particularly gratified to see a number of *Selenia lunaria* Schiff., a species which, apart from a single Scottish example, has until now managed to elude me. Females of both these were kept for ova and duly obliged over the next few days. From these eggs we both reared a series of the former later at their second brood, while I am over-wintering pupae of the latter. The only other species of real interest to us from the trap were four nice white males

As the morning was sunny we visited the nearby Newton Castle for *Leptidea sinapis* L., which fluttered before the car

along the approach lane in numbers, and was even more abundant on the hillside by the castle, the bramble-covered slopes making a sharply contrasting habitat to the woodland rides of its English localities, the vetches between the brambles proving that this was a breeding ground. We each netted a series of this attractive Irish variety, finding that females were rather harder to come by than males. Our picnic lunch was consumed here before driving along the coast to Fanore Strand, which is a fairly small and isolated area of steep sand-hills situated between Graggagh and Marroogh, where the river Caher meets the sea. Even in this sandy place, the inevitable low flat areas of rock-pavement were present between the dunes. We spent several hours there looking for *Zygaena purpuralis sabulosa* Tremewan, but eventually had to give up, returning to our hotel with only two full-fed larvae of *Setina irrorella* L. to show for our trouble, which we had found on lichen covered rocks.

Heavy rain began falling after dinner, and a strong wind as well made it obvious that Doolin Strand would be unworkable that night, so we drove to Ballyvaughan at dusk, hoping to find some shelter from the wind along that coast, but though we dangled one m.v. over the cliff in a fairly sheltered niche, the response was so poor that we gave up, and were eventually reduced to taking turns netting moths in the car headlights as the other drove slowly along the road. This curious method of collecting produced several *C. salicata*, and during one of my spells outside, I even managed to net a *Cerura vinula* L., but with net and clothes becoming saturated, we decided to call it a night. On our return trip, we met up with the third member of our party, M., who had flown over with his family earlier that day. We found he had plugged in a trap a mile down the road past ours, and was just packing up his portable light, having reached the same conclusion as we had.

The following morning, which was brighter but with a keen wind, saw us all at Ballyvaughan examining the traps, which had again taken moths in good numbers despite the foul night, though they contained a similar selection to that of the previous night. After sorting our captures, we tried walking up the nearby stony fields, where I concentrated on flushing *salicata* from the rocks, on which I understand, they are supposed to rest, but on this and every other occasion neither of us saw any in daylight and I noted later, when rearing this species, that the newly emerged specimens remained closely plastered to the wall of their cage, even when a pill-box was pushing them along as I tried to coax them inside, so it may well be that they sit tight in the wild, and rely on their camouflage to protect them. Our walking up did produce several species of interest, however; *Erynnis tages* sub-sp. *baynesi* being fairly common here and elsewhere on the Burren, as we subsequently found. We each netted a few *Chiasmia clathrata* sub-sp. *hugginsi*, though nowhere did we find this species commonly.

M., who was staying at Ballyvaughan, finding we were carrying our lunches with us, now returned to his hotel to collect his, while we drove along the coast to Black Head, where the thrift plants growing on the rocks near the shore were inspected for signs of larvae of *Eana colquhounana* Barr., but only managed to locate two each by looking for dead patches on the plants, which we had been advised were feeding signs. On a subsequent visit I realised that a fine silk tube amongst the leaves, which was really an extension of the resting and pupating tube of thicker silk which goes down into the matted roots of the foodplant, was a more obvious guide to a larva being present. On this occasion apart from the difficulty of stopping these very active larvae from running down their tubes and into the crevices out of which the thrift grew, whence nothing short of dynamite would remove them, we obtained all that we required. Later, however, for some unexplained reason we only managed to get a few pupae each from them, the majority disappearing without trace from our plastic boxes though M. did report finding a few parasitic fly cocoons among his, which, no doubt, accounted for some. Those which did pupate emerged eventually without further trouble.

When M., rejoined us, we drove to the Gleninagh mountain, and after lunching by the side of the river Caher, which flows between this and the higher mountain, Slieve Elva, we crossed the small meadows, which are the lower slopes of the former mountain, noting that the short-cropped turf was studded thickly with the brilliant blue flowers of the Spring Gentian, which grew here in greater abundance than anywhere else in the Burren we had seen. As we progressed higher several *Cupido minimus* Fuesl. were netted as they flitted about behind the shelter of the stone walls, which offered some protection from the keen wind. Eventually the walled fields gave way to the usual rock-strewn slopes, where the gentians were still fairly common, but now were swamped by the creamy white, gold-centred flowers of mountain avens, which covered the rocks, and turf between, in great clumps. This attractive flower also grew at lower levels elsewhere. The red of bloody crane's bill and unidentified orchids and large patches of yellow trefoil made a beautiful natural rock garden of this mountain-side. In our search for less obvious plants we noted several of the lone green flower-spikes of that very rare plant, the dense-flowered orchid, in this, its only British locality; we were to meet other examples of this plant in other parts of the Burren later. Small moths were being flushed from the herbage as we progressed upwards, but were carried away so fast in the wind that we found it nearly impossible to sample them. We did, however, manage to secure three specimens of the large and attractive *Chilodonia pierci* Obraztsov, finding subsequently that this species was to turn up at the Ballyvaughan traps commonly. After walking by it on the way up, we eventually located the prostrate juniper on the high slopes as we climbed back down, finding

that it hugged the rocks so closely that it was only with some difficulty that we were able to lift it up enough to slide the sheet we had taken up for the purpose, beneath the bushes. This done, we beat a large number of *Thera cognata* Thunb. larvae, from which we eventually reared a series each of this large and rather purplish race. Mountain cudweed plants were closely inspected, but there was no sign of *Platyptilia tesseradactyla* Treits. nec L., of which we had hoped to find imagines at rest on the flowers. Though we searched here again and elsewhere where cudweed was located, over the following days, we failed to see this species, or, for the matter of that, another of the Burren plume specialities, *P. icterodactylus* Mann, though cold winds and rain may have been the reason for our failure. Bog rush seed-heads near the river were also searched for *Glyhpipteryx schoenicolella* Stt., but with a strong wind blowing, it was not surprising that none of these small moths was found. We returned to our respective hotels for dinner, and met up with M. again just before dusk at Doolin, where we lined our six m.v. lights up along that flower-bedecked coast on a rather windy night in which we were to see only two *caesia*, a few *venosata* and *capsophila* and little else. With nothing having responded to our lights since midnight, we packed up at 1 a.m.

We met as usual at the Ballyvaughan traps, to which M. had added a third trap overnight, finding all the usual species for this area in them plus a few *capsophila*, which was a rather uncommon visitor here. *Caesia* failed to turn up at the traps throughout our stay, even though these lights were within sight of and fairly close to the coast. A bonus for R. and myself, which we found sitting on a bracken frond near his trap was a female *Lithophane socia* Hufn., which was unbelievably plump, considering it was so worn as to be devoid of markings. Nevertheless, she laid a good quantity of ova during the following weeks, and we both raised a series of a species we had found very slow to come by nearer home, though M. had just managed to complete his series elsewhere the previous autumn.

We again walked up the adjacent fields to see what we could flush in the morning sun, but we had not gone far when I spotted a fine fat *Z. pupuralis* larva sitting on a rock. A closer search at this spot produced nothing more, so we agreed to go on to Fanore Strand, where, we hoped, with a living example before us, to find more. However, a long and determined search there proved fruitless, and it was more from desperation than hope of success that I started plucking moss where the thyme grew through, reasoning as I did so that if larvae were not available, cocoons must be. I was pleasantly surprised immediately to find two of these rather small oval brownish cocoons, spun up among the moss just below the surface. We returned to the attack with renewed vigour after this lucky break, but after an hour of kneeling on the spongy turf, which was becoming rapidly wetter as the odd

showers which had been falling, changed to continuous rain, and with only four more cocoons to show for our labour, we were obliged to give up for the time being. We then turned our attention to a small heap of sand nearby, which was covered by a curious clinker type loose rock, which was easily turned over without kneeling in the wet; beneath these we found a number of *irreorella* pupae spun up in a loose web of silk, together with a few larvae, and one newly emerged moth, this being of a much deeper shade of orange than the insipid specimens collected from the Isle of Wight a few years ago, as indeed were all the specimens we eventually bred from Fanore, R. also spotted several *Mniophaga mundella* Dougl. grouped together under one rock and a careful scrutiny beneath other rocks produced more specimens together with a few *M. umbrosella* Zell.

With the rain now very persistent we adjourned to our hotels to catch up on our setting late in the afternoon, and again after dinner.

The following morning was no better, and we decided, after a quick look through the trap's poor intake, that this was an opportune moment to make our only collecting trip away from the Burren, to Killarney where we wanted to try for pupae of *Aegeria scoliaeformis* Borkh. We had been informed that they infest some of the birch trees there. We were soon on our way and during a brief wait for the ferry to cross the river Shannon M. beat an *Orneodes hexadactyla* L. from bushes growing along the north bank. It was early afternoon by the time we had located the birches near Killarney, but though we found plenty of old *scoliaeformis* workings, no new mines could be detected though we searched for several hours. By now the day had brightened up, and we saw *Celastrina argiolus* L. flying about some roadside hollies in fair numbers, M. tried to catch some of these, but ended up netting *Rheumaptera hastata* L.

A small shamrock plant was found growing on the trunk of one large birch, causing us to look at the ground, where we found we had been walking among these plants for some yards without realising it. Some of the small and rather delicate pale blue flowers were on them, and I mused on how many thousands of people there must be who know exactly what a shamrock leaf looks like, but I wondered just how many of them could describe the flower, or say what colour it is? Another plant we saw in a nearby spot was the bog violet, whose single blue flowers, an inch or more across, were really eye-catching against a drab background of dead grasses and peat. With the afternoon nearly gone we suddenly realised we would have to depart if we were to catch the next ferry to get us back in time for dinner, and after a mad dash, we just made it, though we left a few worried looking jaunting cart drivers behind us in Killarney, I am afraid.

(To be continued)

Pseudagrion rubriceps Selys in tandem with
Pseudagrion microcephalum (Rambur) (Odonata,
 Coenagriidae)

By TRIDIB RANJAN MITRA and A. R. LAHIRI.

Entomology Laboratory, Deptt. of Zoology, Calcutta University

In nature examples of abnormal tandem flight of certain Anisopteran and Zygopteran Odonates have been recorded by several workers (Corbet, 1962; Bick & Hornuf, 1965 and Bick, 1971). But so far no report has been available as to such examples in *Pseudagrion* damselflies.

This note reports two such cases when the males of *Pseudagrion rubriceps* Selys were caught in tandem with females of *Pseudagrion microcephalum* (Rambur) in the morning of a rainy day in the month of September, 1966 in Calcutta.

In this connection it may be reported that no attempt to copulate was noticed in either case, though prior to their capture they were in tandem for a reasonable time.

In this connection it may also be mentioned that females of *Pseudagrion rubriceps* are not represented in our collection although both the sexes of the other species mentioned above are there. Fraser (1933) perhaps correctly pointed out the rarity of the females of *P. rubriceps* in the Indian sub region.

Thus from the above facts it appears that Moore's hypothesis (Moore, 1957 and 1960, in Corbet, 1962) on such abnormal behaviour, as also noted in these cases, in Odonates perhaps holds good.

The authors are thankful to the Head of Department of Zoology, Calcutta University for facilities, to Dr D. N. Ray Chaudhuri of the same department for guidance and to Dr D. E. Kimmins of the British Museum (Nat-Hist), London, for conformation of our indentifications.

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YPSOLOPHUS HORRIDELLUS TREITSCHKE IN KENT.—Reading Mr S. N. A. Jacobs's note in the September issue of *The Record* has prompted me to give another Kentish locality for this moth. The larva (unknown to me at the time) was taken on blackthorn in Chestfield, near Whitstable, in May 1971, and the moth emerged on the 10th July of that year.—E. S. BRADFORD, 38 Oakwood Ave., Boreham Wood, Herts. 26.xi.1971.

The North American Tortricid Moth, *Endothenia hebesana* (Walker, 1863), a member of the Fennoscandian fauna

By M. OPHEIM

Last summer (1970) in a collection of Microlepidoptera belonging to Leif Aarvik, a high school boy, I noted a dark *Endothenia* species, captured near the city of Gjøvik (Os), Norway, on 3rd June 1970. By dissection it was found that the specimen, a female, has a broad and sclerotized ostium (fig. 4) distinct from any of the palaearctic *Endothenia* species known to me from the accessible literature. However, in a monograph by Heinrich (1926) on the North American Laspeyresinae and Olethreutinae, I noted that *Endothenia hebesana* (Walker, 1863) had a similar ostium to that found in the Norwegian female (Heinrich, fig. 188).

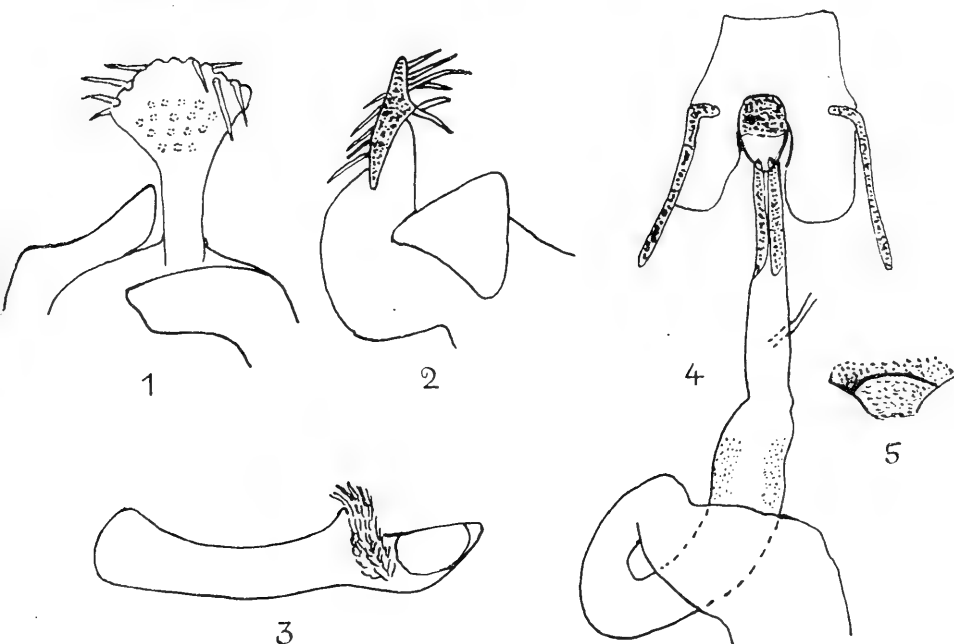
As it was necessary to obtain more material, especially of ♂♂, I asked Aarvik to try to collect more specimens this summer (1971). Subsequently, he made a search for the species around Gjøvik up to 5 km from the city, and had the very good fortune to capture 3 ♂♂ and 5 ♀♀ between 16th June and 6th July in forest clearings.

E. hebesana is according to Heinrich (1926) a very common species in U.S.A., occurring from the Atlantic to the Pacific Ocean. It is also found in the southern part of Canada. The larva of the species lives on several different plants, of these Solidago, Stachys and Vesbascum are commonly found around Gjøvik.

Recently, I noticed that Falkovitsh (1970) considers *Endothenia adustana* Krogerus, 1947, from the northern shore of Lake Ladoga in Carelia, as a junior synonym of *E. hebesana*. Falkovitsh also mentions that the species has been found in Southern Siberia. As I had considered the Norwegian specimens quite distinct from *E. adustana* due to the dark and monotonous forewings of the latter as illustrated in fig. 2 (Krogerus 1947), and there also seems to be some differences in their male genitalia, I asked my good friends at the Zoological Museum, Helsingfors, Dr W. Hackman and Dr J. O. Kaisila, to send me two specimens of *E. adustana* for inspection. I received two females, one of which was dissected. The genitalia were in full agreement with those of the Norwegian specimens (figs. 4, 5).

However, I think that the Norwegian population should be recognized as a new subspecies, *E. hebesana toteniana* nov. ssp. (named after a district on the west side of Lake Mjösa).

Description: The forewings have grey ground colour, black transverse markings, and many tiny orange-brown spots. These spots seem to be more numerous in the Norwegian subspecies, particularly in the female. On the costa they are also present in the discal and basal areas, but absent in the Carelian speci-



Figs. 1-5. *Endothernia hebesana toteniana* nov. ssp. 1-3, male genitalia; 1, uncus, tegumen, socii; 2, same, lateral view; 3, valva. 4-5, female genitalia; 5, signum.

mens. In the male genitalia the uncus has a shorter neck, 8 to 10 thorns on the outer edge, and several weaker ones on the dorsal side (figs. 1, 2). Aedeagus short and broad, without cornuti.

Expanse: 15-18 mm.

Holotype: Gjøvik, Opland, Norway, ♂ 20th June 1971, Gen. prep. 4843 (L. Aarvik leg., coll. Zool. Museum, Oslo). Paratypes: Same locality 2 ♂♂ 24th June, 6th July 1971, ♀ 3rd July 1970, 3 ♀♀ 16th June, 2 ♀♀ 22nd June 1971 (leg. & coll. L. Aarvik).

Endothernia hebesana which occurs commonly in North America as mentioned above, seems to be extremely local in the palaearctic region, but I am inclined to believe that by persistent search the species can be discovered in several more localities. We can probably leave out of consideration an accidental introduction of the species from North America, as the recorded localities are situated far from large communication centres.

The species has not been included in the new catalogue of Fennoscandian Microlepidoptera (1971), because the above mentioned part of Carelia was ceded to U.S.S.R. in 1944.

Acknowledgements

My sincerest thanks are due to Leif Aarvik for the loan of specimens of *Endothernia hebesana*, and to the curators, Dr. W. Hackman and Dr. J. O. Kaisila, Zoological Museum, Helsingfors, for the loan of 2 ♀♀ of *Endothernia adustana*.

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Magdalis memnonia Gyll. (Col., Curculionidae), a Weevil New to Britain

By A. A. ALLEN, B.Sc., A.R.C.S.

Whilst on a visit here recently, Mr P. J. Hodge, of Ringmer, Sussex, showed me a very large black *Magdalis* that he had taken off grass in Friston Forest, near Eastbourne, on 12th June of this year, and which he and his friend Mr R. D. Dumbrell of Polegate, Eastbourne, had made out from Reitter (1916, *Faun. Germ.*, **5**: 125-6) to be *M. memnonia* Gyll.—a species previously not known to inhabit Britain. I have since fully satisfied myself of the correctness of this determination. In the Continental keys the beetle at once 'runs down' to *memnonia* among the rather numerous species of the genus, of which at 5-9 mm. in length (without rostrum) it is, at least in mid-Europe, easily the largest. Among our fewer species, its size, together with other characters, should make it recognisable almost at a glance—only large specimens of *carbonaria* L. normally exceeding 5 mm. Mr Hodge's example of *M. memnonia* is a female of 7 mm.

The salient features of the species are as follows:—

Entirely deep black above, surface between the punctures shiny. Scape of antennae quite unlike that of *M. carbonaria*, being much longer and thinner and strongly curved in the region of the apical thickening (straight in *carbonaria*). Pronotum long, subconical, smooth, thickly punctate, sides without trace of lateral tubercles or of constriction towards base; posterior angles projecting backward but not sideways. Elytra a little widened behind, the base of each raised into a curved compressed keel much stronger than in *carbonaria*; their sculpture characteristic, the striae being catenate (chain-like) with deeply impressed linear-oblong punctures well separated by transverse bar-like shining intervals; interstriae with punctures irregularly uniseriate, and so densely crowded as to leave only narrow raised rim-like shining interspaces. Mid-femoral tooth larger than the others (at least in this specimen).

M. memnonia belongs to the subgenus *Magdalis* s.str., the members of which are practically restricted to Coniferae; but which (though comprising the bulk of the genus) included only two¹ certainly known as British up to now, namely *phlegmatica* Hbst. and *duplicata* Germ. These however are both dull dark blue or greenish-blue species peculiar to the Scottish Highlands. Quite apart from its superior size, the elytral sculpture—which presents a strongly rugulose aspect—renders the species under notice unmistakable.

Reitter (l.c.) records *M. memnonia* as general on diseased pines throughout Germany, and Horion (1951) gives its distribution as all central and southern Europe up to Denmark—where it is reported by Hansen (1965) as rare. The wood in Sussex where the insect was taken is planted with conifers, some of them in a sickly condition, so that its breeding there is a high probability. The occurrence of a single example only is without significance because the captor, unaware at the time of the interest of his find, did not revisit the locality; but we hope to establish the fact of its breeding next year. *M. memnonia* must be regarded as an introduction or, possibly, a natural immigrant, and like a number of such species may well spread to other areas—indeed it may already have done so. It need not, however, be feared as a potential pest, since it does not appear to attack healthy trees.

¹*M. violacea* L., as I shall show later, cannot be admitted to our list without further evidence.

63 Blackheath Park, London, S.E.3. 3.xii.71.

Notes and Observations

HELIOTHIS ARMIGERA HUBN IN DORSET. — The paucity of moths in my trap in Surrey during October decided me to give the West Country a try, despite the late date. I journeyed down to Charmouth on 25th Oct. I stayed at a place I knew well from my fossil hunting days, that overlooks the river mouth and has grounds within 200 yards of the cliffs. There are fine old *Macrocarpus* trees in the garden.

I ran a Robinson trap on the tennis court and found time on arrival, to work out an ivy run.

Hopes of late *Lithophane leautieri*, Boise. were raised and lowered by the irritating habit of *L. ornitopus*, which sat about on the macrocarpus trunk as if they had just emerged.

Throughout the next three nights moths were plentiful to both light and ivy. *Phlogophora meticulosa* Linn. averaged 50 per cent night and *Agrochola lota* Clerck. was also very common. An unexpected visitor to the trap was *Gripesia aprilina* Linn. of which three were taken, though oak is very scarce in the district.

On the first night the ivy yielded a fine *Lithophane semi-brunnea* Haw., a single *Lucania l-album* Linn. and one huge *Rhizedra lutosa* Hubn. Light produced nothing exceptional.

On Tuesday 24th the trap was moved to a more exposed position, where, despite a stiff north-east wind, results were much better, and I was able to complete a short series of *L. l-album*, *R. lutosa*, *Eumichtis lichenea* Hübn. and *Aporophyla nigra* Haw. It was on this night that I took a beautiful male *Heliothis armigera* Hubn. on ivy blossom.

The final night started clear and cold with a quarter moon, but by 7.30 a ceiling of sea mist obscured the moon and the temperature rose from 47°F to 52°F in half an hour. This was another excellent night with most of the same species arriving in numbers. An additional species was a lone *Peridroma porphyrea* Schiff. Several *Noctua pronuba* Linn. were still flying — a very late date, while a single *Erannis defoliaria* Clerck. was exceptionally early.

During the daytime, in warm sunshine, I found third brood *Lycaena phlaeas* L. flying, and saw a single *Colias croceus* Fourc. coming in from the sea.

I returned home to Surrey on the 28th after a most successful trip on which I had recorded 39 species including *armigera*. —E H. WILD, 112 Foxearth Road, Selsdon, Croydon Surrey.

CLOSSIANA SELENE DENIS & SCHIFFERMÜLLER: SECOND BROOD SPECIMENS.—I was very interested in Mr R. F. Bretherton's reference (*Ent. Rec.*, **83**: 325) to second brood examples of this species, and agree that these are of rare occurrence. The fact that the fresh female caught on the 27th August 1971 is also considerably smaller than normal specimens is also of interest. I do not claim to have seen any second brood examples of this butterfly in the wild, but in September 1959, Dr A. M. Heron and myself reared several in captivity. Ova were obtained from a wild female taken near Aviemore in June of the same year, and the larvae fed on a mixed diet of wild violet and pansy leaves. Most of the butterflies were of normal size, but two were slightly smaller. In the same month and year we also reared a few examples of *Clossiana euphrosyne* (Linnaeus). The female parent was taken in May 1959, at Silverstone, Northants., and again the larvae were fed on violet and pansy. The butterflies are particularly fine, being of normal size and in two or three examples, marked with additional black near the wing base. I should add that the larvae of both species were reared at normal room temperatures. On subsequent occasions Dr Heron and I have attempted to rear more of these two butterflies in late summer, but with no success. The larvae resisted our efforts, even when higher than normal temperatures were imposed. Frowhawk mentions that although second brood examples of both species are recorded, they are few in number.—GEORGE E. HYDE, 26 Warrington Drive, Bessacarr, Doncaster, Yorks. DN4 6SS. 20.xi.1971.

LITHOPHANE LEAUTIERI BOISDUVAL IN WEST SOMERSET.—The latest account of the distribution of *Lithophane leautieri* Boisd. as a breeding species (1968, *Proc. Brit. ent. nat. Hist. Soc.*, 1: 73) states that it is confined in Britain to the southern seaboard counties from Eastbourne to Torquay.

In view of this, some account of its occurrence in West Somerset may be of interest.

A Robinson mercury-vapour light trap has been regularly in operation on all suitable occasions since 1956. From 1956 to 1963 this was situated on the borders of the built-up area of Minehead. From 1964 to 1971 it was operated in rural conditions at Selworthy about three miles west of Minehead. In Minehead there were two mature specimen trees of *Cupressus macrocarpa*, probably planted when the house was built about 65 years ago, while there were, also, a number of these trees in the vicinity. At Selworthy there are no large *macrocarpa* trees in the immediate neighbourhood, the nearest being nearly a mile away.

The first appearance of *leautieri* was in 1963 in Minehead after seven blank years. It occurred at Selworthy in early October and in small numbers (1-3) every year from 1964 to 1969, missed out in 1970, but turned up again this year (2).

If any conclusions can be drawn from these records it seems to me probable (1) that *leautieri* breeds in the Minehead district and (2) that it may only have commenced to do so in the early 1960s.

There has been only one other report from Somerset, from Shipham on the Mendips in 1966.—H. M. CHAPPEL, The Old Rectory, Selworthy, Minehead, Somerset. 25.xi.1971.

BLASTOBASIS DECOLORELLA WOLLASTON IN KENT AND ESSEX.—It has been a habit of mine during the past few years to collect moss and lichen from walls, rocks, etc., in anticipation as to what may emerge from it later on. This year was no exception, and from moss growing on a wall at Folkstone, Kent, which I gathered at the beginning of April, four specimens of this moth emerged between the 6th and 8th of June.

As far as I know, this is the first time either ova or larvae have been taken wild in this country, and the first time that moss has been noted as a pabulum for the species. There is an interesting article on this species by Mr S. Wakely in The Proceedings and Transactions of the South London Ent. and Nat. Hist. Society for 1947-48, when he first noted the species in Britain. Here it is stated that dead insects as well as other detritus formed the food substance of specimens reared by him. There were quite good growths of moss and lichen on the wall from which I gathered my supply, which contained its own fauna of live and dead insects etc. Apart from the four specimens of *B. decolorella* there also emerged from the moss one very dark specimen of *Blastobasis lignea* Walsingham.

At the Stanford-le-Hope field meeting of the British Ent. and Nat. Hist. Society on the 3rd of July 1971, I was invited to

help myself to anything that took my interest from the M.V. trap run by Mr R. Tomlinson in his garden the night before. Included amongst a number of micros I took were five specimens of *B. decolorella*.—E. S. BRADFORD, 38 Oakwood Avenue, Boreham Wood, Herts. 8.xi.1971.

Obituary

PERCY CUE
(1877-1971)

With the death on September 5th 1971 of Percy Cue at the remarkable age of 94, British Entomology has lost its oldest collector, who was active in the field when he had passed his ninetieth year. Born in Hammersmith as far back as July 1877, the flair for butterflies and moths was manifested when he was quite young. Soon after leaving school, he went into business, which took him to Stuttgart in the early years of this century.

He made a fine collection of the lepidoptera of this rich region. He remained in Germany to near the outbreak of the war in 1914, when his firm opened a branch in Ashford, Kent, which town and district were to be his home for the rest of his long life. In the period between the wars, when he became managing director of this large factory, he found little time for entomology: it was after 1945 when he once more took up the pursuit of lepidoptera with his former enthusiasm, an enemy bomb having destroyed his foreign insects. For the next quarter of a century he made a thorough collection of the Ashford district, running a mercury vapour light trap nightly in his garden on the outskirts of the town. Hamstreet and Hoads Wood were also among his favourite haunts. Further afield, he wielded his net mainly in southern England, though he did quite a lot of collecting in north Lincolnshire when staying with a member of his family.

In this way he got together a large and comprehensive selection of most of the English macro-lepidoptera, including several rarities. One of the most remarkable strokes of good fortune was his finding a *Plusia confusa* Stephens in 1954 on a fence outside his home. Other choice captures in his trap included the striped hawk (*Celerio livornica* Esper), the ni moth (*Plusia ni* Hübner), the flame wainscot (*Meliana flammea* Curtis), a great rarity in Kent, while an almost black example of the oak beauty (*Biston strataria* Hufnagel) was probably his best prize. That large genus of the geometers, the pugs, always took his fancy, and he became an expert breeder of many of them, even venturing to the Norfolk coast when he was over 80 to obtain larvae of *Eupithecia extensaria* Freyer. In 1961, that great year for the crimson-speckled footman (*Utetheisa pulchella* Linné) he was lucky enough to secure a superb specimen at Dungeness. Often in May in his apple

orchard, that scarce little insect, the pinion spotted pug (*Eupethecia insigniata* Hübner) graced his trap or his house.

All his captures he used to set most meticulously, even when he was 90, always in the continental style on high pins, and most beautifully displayed.

Apart from entomology, he was in earlier days a keen fisherman and an egg collector. He liked a good game of bridge, and was an accomplished billiard player.

In 1964 he and his wife, whom he originally met in Stuttgart, celebrated their diamond wedding surrounded by many descendants to the fourth generation, and they were the proud recipients of a telegram from the Queen.

Percy Cue was perhaps best known to those collectors who were frequent visitors to Kent, but he was always ready to welcome all who shared his interests. Of the most kindly nature, he was virtually indefatigable, right to the end of his long and active life, and all sympathy goes out to his wife and family.

C.G.M.deW.

Current Literature

Atlas Provisoire des Insectes de Belgique, edited by Jean Leclercq.

I have already reviewed the file containing maps 1-100 (Ent. Record 83: 28), and I have now received from Messrs E. W. Classey Ltd., the distributors, three further files of insect maps (101-200, 201-300 and 301-400), and maps 1-24 in a file designated "Arthropodes non Insectes."

File 2 101-200, shows in 101, the agricultural regions of Belgium, and 102 shows additions to maps 1-100 since their publication. Maps 103-174 deal with Hymenoptera species and 175-200 Lepidoptera.

File 3 (201-300) shows the grid system for Belgium on 201, and on 202, the location of sand-loving plants. Thereafter, 203-278 deal with Hymenoptera and 279-300 with Coleoptera.

File 4 (301-400) shows a map of the forest areas of Belgium on 301 and of the natural forest vegetation on 302. 303-377 deal with coleoptera and 378-400 with Lepidoptera.

The non-insect Arthropod file gives the grid system for Belgium on 1 and a summary of all species recorded in this part on 2. Thereafter 3-24 deal with Diplopoda species. This part is edited by Jean Leclercq and Philippe Lebrun.

The files maintain the foolscap format and are priced at £1.00 each for the 100 map files and £0.50 for the non-insect file, postage extra. The postage rates quoted are one part £0.12, two parts £0.18, three £0.23, and four or more £0.29.

It is good to see this important survey making such good progress and the editors are to be congratulated on their efforts.—S.N.A.J.

Lepidoptera Genetics, by **Roy Robinson**. International Series of Monographs in Pure and Applied Biology. Zoology Division, Volume 46, pp. ix, 687, text figs. Pergamon Press, Oxford. Price: £10.00.

The lengthy introduction to this book deals with diverse subjects, including colour and pigmentation, seasonal and environmental influences, discovery of aberrations, resistance to insecticides, hybrids, nomenclature, reproduction, sex determination, sex ratio, gynandromorphism, intersexes, and parthenogenesis.

Chapter one deals with the elements of lepidopterous genetics, chapter two with elementary biometry, and chapter three discusses population genetics and polymorphism. This is followed by a chapter on industrial melanism, this phenomenon being chiefly illustrated by a classic example — the evolution of the melanic forms of *Biston betularia* (Linnaeus). Chapter five deals with the evolution of mimicry. Chapters six and seven discuss in detail the genetics of the Rhopalocera and Heterocera respectively, while the final chapter deals with the karyology of Lepidoptera.

An extensive bibliography, and indexes of authors and subjects, and species, subspecies and aberrations are appended, the latter being arranged under genera and of limited use. The species discussed in chapters 6 and 7 are arranged in alphabetical order according to genera, which is quite unnecessary as each has been fully indexed.

On the question of nomenclature the author clearly indicates that he is aware of the many shortcomings in his book and states that the inclusion of authors in a review article savours of pedantry! He states that the problem of name changes is rather a nuisance for a work which deals with an entirely unrelated aspect of entomological research, a statement I find difficult to understand. However, some attempt appears to have been made in bringing the nomenclature up to date, as can be seen from Table 2 which lists a number of name changes or synonymies. However, the value of the book would have been enhanced if a list of the names used had been checked by specialists and any changes correlated and adopted throughout the work before its publication.

This book appears to be primarily a review or a collation of the genetical studies that have been made on the lepidoptera. There is no doubt that it will serve as a useful reference work and should form a basis for future research on the genetics of Lepidoptera. Few references appear to have been omitted although it is extraordinary that there is no mention of Dryja's monographic work on the genetics of *Zygaena ephialtes* (Linnaeus) (Dryja, 1959, Badania nad Polimorfizmem Kraśnika Zmienego (*Zygaena ephialtes* L.), Warszawa).—W.G.T.

mon. Mag., 1: 190). Cobham; May 26, 1912 (F. Grant).

7. Wigmore Wood, not common (Chaney, 1883-87). Hollingbourne, three, May 11, 1907 (R. A. Jackson, *Diary*). Sittingbourne (H. C. Huggins). Westwell (Scott, 1936); 1946 (Bull, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1946-47: 169); one, August 8, 1951 (C.-H.); one, 1957 (E. Scott *teste* P. Cue).

8. Folkestone* (Ullyett, 1880); one, August 16, 1937 (A. M. & F. A. Swain coll.). Stowting; Brook (C. A. W. Duffield). St. Margaret's Bay, one, August 21, 1890 (Fenn, *Ent. Rec.*, 1: 204). Dover, one, August 10, 1944 (B. O. C. Gardiner). Dover; Waldershare (E. & Y., 1949). Folkestone Warren, one at light, August 15, 1946 (A. M. Morley). Wye Chalkpit, June 10, 1957, beat seven larvae from buckthorn, moths reared (P. Cue).

9. Broadstairs, one, March 30, 1920 (J. W. C. Hunt). Minster, March 27 (4), April 7 (5), 21 (2), 1921, all around gas lamps (H. G. Gomm). Cliftonville, one, September 10, 1951 (W. D. Bowden).

10. Brasted, occasionally (R. M. Prideaux).

11. Tonbridge, one, April 30, 1871 (Raynor, *Entomologist*, 6: 79). Edenbridge, 1932, 1934 (F. D. Greenwood). Watlingtonbury, three in E. Goodwin coll. (C.-H.).

12. Ham Street, April 9, 1933 (J. H. B. Lowe).

13. Tunbridge Wells (E. D. Morgan).

14. Tenterden, c. 1855 (Beale, *Diary*). Sandhurst, one, 1929, in G. V. Bull coll. (C.-H.).

15. Dungeness, six at willow blossoms, April 3-4, 1946 (A. M. Morley).

16. Folkestone, one, August 20, 1928, one, May 5, 1929, one at willow, March 25, 1945 (A. M. Morley).

FIRST RECORD, 1831: Stephens, *loc. cit.*

Philereme vetulata Denis & Schiffermuller: Brown Scallop.

Native. Wood borders, copses, hedges; on *Rhamnus catharticus*.

1. Lewisham (Fenn, *Ent. week. Int.*, 9: 59); abundant, 1861-62, one, 1863 (Fenn, *Diary*). Pauls Cray Common, fourteen, July 21, 1888 (Fenn, *Diary*). Hayes (Carr, *Entomologist*, 32: 40). Bexley (L. W. Newman, *Wool Surv.*, 1909); larvae common on one bush, 1943 (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1943-44: 20). Chislehurst, 1909 (Sperring, *Ent. Rec.*, 22: 13). Farningham, a few larvae on *R. catharticus* (R. G. Chatelain). Bromley, July 28, 1963 (1), July 22, 1965 (1), July 5, 1966 (1) (D. R. M. Long).

5. Westerham (R. C. Edwards. Biggin Hill, larvae on *R. catharticus*, June 3, 1958 and in 1965 (C.-H.). High Elms, several worn, July 23, 1963 (R. G. Chatelain).

6. Between Darenth and Dartford, four, July 13, 1888 (Fenn, *Diary*). Greenhithe* (Farn MS.). Gravesend (H. C. Huggins). Eynsford, near rifle range, larvae on *R. catharticus*, June 4, 1965 (R. G. Chatelain). Wrotham, July 20, 1965 (T. Peet).

6a. Darenth Wood (Stephens, *Haust.*, 3: 261); 1864 (Meek, *Ent. mon. Mag.*, 1: 190); 1891 (James *Entomologist*, 25: 67); Buckell, *Ent. Rec.*, 2: 190). Chattenden Roughs, not common (Chaney, 1883-87).

7. Wigmore Wood (Chaney, 1883-87). Westwell (Scott, 1936); one, 1960 (M. Enfield). Bearsted, one, 1947 (G. Law). Molash Woods, one, July 3, 1949 (T. G. Edwards). Boxley (A. H. Harbottle).

8. Brook (C. A. W. Duffield); common (M. Singleton). Alkham; Waldershare (E. & Y., 1949). Woolwich Wood, one, July 2, 1950 (W. D. Bowden). Lydden, larvae plentiful on *R. catharticus*, May 21, 1950 (C.-H.).

11. Hoads Wood, 8-10 flying by day, June 21, 1955 (P. Cue); numbers "beaten from the undergrowth around the low branches of oak", July 1959† (M. Singleton).

12. Willesborough, one, August 2, 1954, one, July 21, 1956; Wye, two, 1954, one, 1956 (W. L. Rudland).

13. Tunbridge Wells* (R. H. Rattray in Knipe, 1916).

FIRST RECORD, 1831: Stephens, *loc. cit.*

P. transversata Hufnagel ssp. **variegata** Lempke: Dark Umber.

Native. Wood borders, copses, hedges; on *Rhamnus catharticus*.

1. Lewisham, five, July 4, 1862; Dartford Heath, one, July 24, 1893 (Fenn, *Diary*). Chislehurst, one, August 3, 1907 (S. F. P. Blyth). Lee; Bexley; Keston (*Wool. Surv.*, 1909). Orpington, 1949 (L. W. Siggs). Abbey Wood, 1954 (A. J. Showler). West Wickham, one, August 9, 1963, in m.v. trap (R. F. Birchenough). Farningham, a few larvae on *R. catharticus*, June 2, 1965 (R. G. Chatelain). Bromley, July 25 (1), 27 (3), 1964 (D. R. M. Long).

5. Farnborough* (Barnes, *Wool. Surv.*, 1909). Downe (Barnes, *loc. cit.*); 1955 (C.-H.). Chevening, larva, May 16, 1914 (Gillett, *Diary*). Westerham (R. C. Edwards). Chelsfield, 1951 (A. M. and F. A. Swain). Cudham, 1952 (L. W. Siggs). Biggin Hill (C.-H.). Sevenoaks* (see under *Variation*). High Elms, two, August 10, 1962 (R. G. Chatelain).

6. Between Dartford and Darenth, July 13, 18, 1888 (Fenn, *Diary*). Greenhithe (Farn MS.). Shoreham* (Carr, *Entomologist*, **32**: 40). Gravesend (H. C. Huggins). Culverstone, 1922; Wrotham, 1924 (F. T. Grant). Eynsford, several larvae, June 7, 1932 (Kidner *Diary*). (L. T. Ford); not common (B. K. West). Pinden (E. J. Hare). Otford (W. B. L. Manley); June 21, 1959 (Trundell, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1959**: 89). Eynsford larvae on *R. catharticus*, June 4, 1965 (R. G. Chatelain).

6a. Darenth Wood (Stephens, *Haust.*, **3**: 260); (James, *Entomologist*, **25**: 67, **28**: 86).

7. Faversham (Barrett, *Entomologist*, **3**: 331). Wigmore Wood; Darland Hill (Chaney, 1883-87). Westwell, July 16, 1934 (A. J. L. Bowes); one, 1959 (M. Singleton); two, 1960 (M. Enfield & D. Youngs). Soakham Downs (Scott, 1936). Godmersham, 1938 (C.-H.). Kings Wood (Scott, 1950).

8. Folkestone* (Ulliyett, 1880). Elham, five, July 4-7, 1934 (Busbridge, *Diary*). Ewell Minnis; Shepherdswell; Whitfield; Wingmore (E. & Y., 1949). Dover, very common 1945, seen most years 1945-52 (B. O. C. Gardiner). Lydden, larvae fairly plentiful on *R. catharticus*, May 21, 1950 (C.-H.). Brook (Scott, 1936); one, 1959 (M. Singleton). Crundale, larvae, May 17, 1937 (E. Scott). Wye (C. A. W. Duffield); one 1954, three 1956 (W. L. Rudland).

11. Yalding (V.C.H., 1908). Aylesford, one, July 17, 1951 (G. A. N. Davis).

12. Wye, one, 1954, three, 1956 (W. L. Rudland). Orlestone Woods, one, July 27, 1967 (T. W. Harman).

16. Folkestone, one, August 5, 1954 (A. M. Morley).

VARIATION.—Lempke (*Ent. Gaz.*, **19**: 30) describes ssp. *britannica* as having the ground colour of the wings of a "much paler brown than that of the nominate form", and illustrates a Kentish ♀, Sevenoaks, 22.vi.1954 (plt. 3, fig. 6).

FIRST RECORD, 1831: Stephens, *loc. cit.*

Euphyia biangulata Haworth: **picata** Hübner: Cloaked Carpet.

Native. Woods; foodplant unknown.

1. Abbey Wood; Shooters Hill (West, *Ent. Rec.*, **18**: 199). Bexley (A. H. Jones in *Wool. Surv.*, 1909). Keston (H. Alderson in *Wool. Surv.*, 1909).

3. Near Canterbury*, July (1871), a fine series (Parry, *Entomologist*, **5**: 394). Canterbury*, July 1902(2), 1906(2), in F. A. Small coll. (C.-H.) Wardwell Wood; Bysing Wood, not uncommon, 1913-14, about 3-4 an evening; decidedly rare, 1924-26, about 3-4 per annum (H. C. Huggins). Blean Wood, one, July 20, 1923, in R.C.K. (C.-H.). East Blean Wood, one, July 7, 1921 (H. G. Gomm). Sturry, one, July 11, 1927 (H. G. Gomm). Clowes Wood, one, July 7, 1945 (P. F. Harris). Little Hall Wood, one, July 7, 1946; Broad Oak, one, July 20, 1946 (C.-H.).

6. Greenhithe* (Farn MS.).

6a. Darenth and its vicinity (Stephens, *Haust.*, **3**: 226). Darenth Wood, 1860 (Fenn, *Ent. week. Int.*, **9**: 59) (Dartford (V.C.H., 1908), may refer). Darenth, one, July 2, 1903, in RCK (C.-H.). "Kent" [? Chattenden], one, 1859 (Allchin, *Ent. week. Int.*, **8**: 5). North Kent [Chattenden]—1874-75 (Porritt, *Entomologist*, **7**: 181, **8**: 219); 1875 (Tugwell, *Entomologist*, **8**: 293). Chattenden (Chaney, 1884-87); ♀ at rest on oak. July 26, 1888 (Fenn, *Diary*). Chattenden Woods, not uncommon (Porritt, *Naturalist*, **6**: 119).

7. Faversham*, 1867 (Barrett, *Entomologist*, **3**: 331). Wigmore; Mark Oak Wood* (Chaney, *loc. cit.*).

8. Folkestone* (Ulliyett, 1880). Reinden Wood, one, 1882 (Salwey, *Entomologist*, **15**: 197).

10. Sevenoaks, June 1868 (Gill, in *Ent. Ann.*, **1869**: 142); one, June 21, 1871 (Raynor, *Ent. Rec.*, **17**: 267). Seal Chart, one, July 5, 1885 (Fenn, *Diary*); (Adkin, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1905-06**: 39).

11. Watlingbury, 1904 (W. A. Cope); (V.C.H., 1908). Aylesford, one, 1954 (G. A. N. Davis).

13. Pembury, common (Stainton, *Man.*, **2**: 112). Tunbridge Wells (E. D. Morgan).

14. Knock Wood, Tenterden, c. 1855 (S. C. Tress Beale, *Diary*). Tenterden, common (Stainton, *Man.*, **2**: 112). Sandhurst, one, c. 1935 (G. V. Bull).

VARIATION.—In RCK are the following: *Ab. albofasciata* Gauckler, one, "Folkestone Dist."; *trans ad ab. albofasciata* Gauckler, one, Blean Wood, 20.vii.1923, W. Rait-Smith.

FIRST RECORD, 1831: Stephens, *loc. cit.*

E. unangulata Haworth: Sharp-angled Carpet.

Native. Woods; foodplant unknown.

1. Birch Wood (Stephens, *Haust.*, **3**: 225). Bromley neighbourhood, 1882 (Watchurst, *Entomologist*, **16**: 19). [West Wickham], 1861 (Huckett, *Ent. week. Int.*, **10**: 115). Farnborough, scarce, 1900 (H. Alderson, *Wool. Surv.*, 1909)..

3. Oldridge Wood, several, c. 1946 (J. A. Parry). Broad Oak, one at light, July 26, 1946 (C.-H.).

5. Chevening, July 6, 1912, July 11, 1913 (Gillett, *Diary*).

6. Longfield, 1867 (Jennings, *Entomologist*, **4** (54): ii).

6a. Darenth Wood (Stephens, *loc. cit.*), [Darenth Wood] (Huckett, *loc. cit.*).

7. Long Beech Wood, common (Scott, 1936); six at light, July 29, 1939 (C.-H.). Westwell, July 13, 1934 (A. J. L. Bowes). Boxley, 1953 (A. H. Harbottle). Hollingbourne, odd ones, 1920-22 (H. C. Huggins).

8. Folkestone*, 1860 (Fereday, *Ent. week. Int.*, **9**: 136); 1912 (Rait-Smith, *Ent. Rec.*, **25**: 174). Between Sandwich and St. Margaret's Bay* (1883) (Shepherd, *Entomologist*, **17**: 137). Elham, two at acetylene light, July 4, 1934 (Busbridge, *Diary*) (Wingmore (E. & Y., 1949) perhaps refers). Elham Park Wood, July 8, 1953 (Wakely, *Ent. Rec.*, **66**: 110; idem, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1953-54**: 45).

10. Westerham*, July 16, 1898 (Heasler, *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1898**: 8). Sevenoaks, June 27, 1920 (Gillett, *Diary*).

11. Hoads Wood, one (P. Cue).

12. Ashford Town, two in garden, c. 1953 (P. Cue). Willesborough, August 20 (1), 21 (2), 23 (4), 1955 (W. L. Rudland).

13. Tunbridge Wells district*, one, 1868 (Cox, *Entomologist*, **4** (62): ii). Tunbridge Wells (E. D. Morgan); three, 1958 (L. R. Tesch *per* C. A. Stace)† Goudhurst, about six per annum, 1955-61 (W. V. D. Bolt).

14. Between Cranbrook and Hawkhurst, several (W. A. Cope).

16. Folkestone Town, one, June 1951 (A. G. Riddell *per* A. M. Morley). FIRST RECORD, 1831: Stephens, *loc. cit.*

Epirrita dilutata Denis & Schiffermüller: November Moth.

Native. Woods, parks, gardens, bushy places, etc.; on hawthorn, aspen, elm, maple, sloe. Recorded from all divisions, except 7 (probably present) and 15. "Generally common" (V.C.H., 1908).

D. R. M. Long records finding the larva at Bromley on hawthorn and aspen, at High Elms (div. 5) on elm and maple, and at Eynsford on sloe.

VARIATION.—Newman (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1907-08**: 93; *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1907**: 11) exhibited a melanic ♂ taken wild in Bexley Woods, October 23, 1907, "the first melanic specimen of this species reported from Kent". In 1900, Buckell and Prout (*Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1900**: 68) stated that the vast majority of London examples belong to *ab. obscurata* Stgr.

In RCK are the following named abs.: *pallida* Prout, "Kent" (2); *melana* Prout, Mereworth, bred 1904 (4); *fimbriata* Haw., "Canterbury Wachter '94" (1); *disjuncta* Lempke, "Kent" (1).

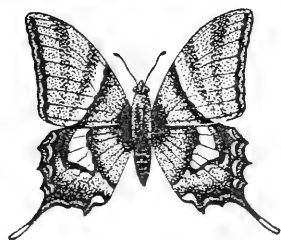
FIRST RECORD, 1720: The larva "was taken on the *White-thorn* . . . near *Peckham*" (Albin. *Nat. Hist. Eng. Ins.*, facing Plt. XLV. As this may refer to Surrey, the first positive Kentish record dates from 1809: *Phalaena fimbriata* Haw., Haworth, *Lep. Britannica*, **2**: 320.

E. christyi Allen: Pale November Moth.

Resident, perhaps native. Woods, copses; on maple, sloe, oak.

Note: Owing to the difficulty of checking genitally much of the recorded material, there are relatively few records of confirmed Kentish occurrence, and unless so confirmed the following should be accepted conditionally.

1. Farnborough, October 1938 (D. Marsh, in de Worms, *Lond. Nat.*, **1956**: 87). West Wickham (E. Trundell, in de Worms, *loc. cit.*). Orpington a feral larva, from which a ♀ ab. was bred October 21, 1949, gen. det. D. S. Fletcher (L. W. Siggs).



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THE PROFESSOR HERING MEMORIAL RESEARCH FUND

The British Entomological and Natural History Society announces that, as a result of applications received by 30th September 1971, awards have been made to Miss J. M. Ruse, Department of Zoology, University of Manchester, to help her research into the biology of leaf miners and their parasites on *Sorbus aucuparia* and related host plants; and to Mr P. R. Cobb, Editor of the Proceedings of the Heacham and West Norfolk Natural History Society, for continuation of his work on the life-cycle and distribution in Britain of the gall-wasp *Andricus quercuscalicis* (Burgsdorff).

Further applications are invited for awards to be made after 31st March 1972, for the promotion of entomological research with particular emphasis on:—

- (a) Leaf miners
- (b) Diptera, particularly Trypetidae and Agromyzidae
- (c) Lepidoptera, particularly Micro-Lepidoptera
- (d) General Entomology

in the above order of preference, having regard to the suitability of the candidates and of the plan of work proposed.

It is envisaged that awards would be made to assist travelling and other expenses, necessary for field work, for the study of collections, for attendance at conferences, or for exceptional costs of publication of finished work. In total they are not likely to exceed about £120 in 1972.

Applicants need not be resident in the United Kingdom, and Research in any part of the world may qualify.

Applicants should send a statement of their qualifications, of their plan of research, and of the precise objects for which an award is sought, to R. F. BRETHERTON, C.B., M.A., F.R.E.S., Hon. Treasurer, Folly Hill, Birtley Green, Bramley, Guildford, Surrey, *early in 1972 and in any case not later than 31st March.*

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with the assistance of

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PLATE III



***Agrodiaetus coelestina* Eversmann and *Cyaniris helena* Stdgr.**

- | | |
|--|--|
| 1 <i>A. coelestina</i> Eversmann ♂ upperside | 2 <i>A. coelestina</i> Eversmann ♀ upperside |
| 3 <i>A. coelestina</i> Eversmann ♀ underside | |
| 4 <i>C. helena</i> Stdgr. ♂ upperside | 5 <i>C. helena</i> Stdgr. ♂ underside |
| 6 <i>C. helena</i> Stdgr. ♀ upperside | 7 <i>C. helena</i> Stdgr. ♀ underside |

Agrodiaetus coelestina Eversmann (A.C.): a Lycaenid new to Greece and Western Europe

By R. F. BRETHERTON, JOHN COUTSIS, L. G. HIGGINS AND
C. G. M. DE WORMS

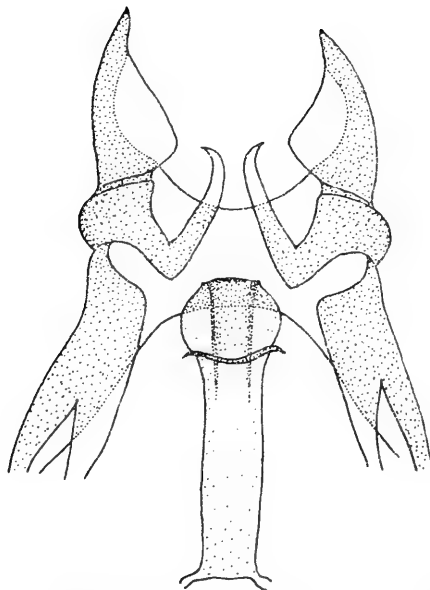
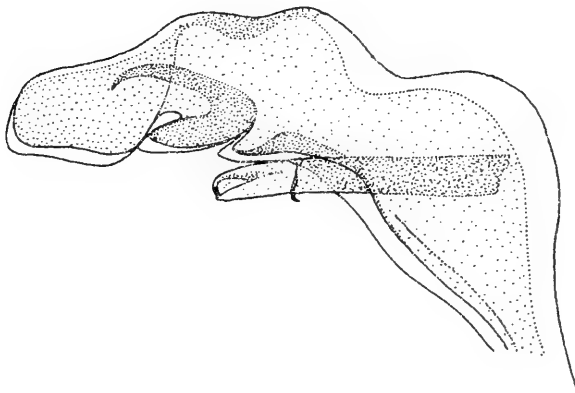
The authors were fortunate to discover, in May and June 1971 on a mountain in the Peloponnese, a Lycaenid which appears to be previously unknown both in Greece and in Europe west of the Soviet Union. The first four specimens, two males and two females, were caught by R.F.B. and C.G.M. de W. flying beside a forest track along with large numbers of *Cyaniris helena* Stdgr.; both species frequented the flowers of a tall yellow vetch. They were at first assumed to be some form of *C. semiargus* Rott., to which *C. helena* has itself been often referred. However, J.C., seeing them on the setting boards, felt doubts about this identification. When he caught a single male himself a few days later he found that it differed in its genitalia, as well as in its colour and markings, from *C. semiargus*; and he suspected that it was a species entirely new to him. Later still he and L.G.H. were able to take a short series of both sexes. Though many of these were worn, they made fuller investigation possible. On his return to England L.G.H. was able after considerable search to determine them as *Agrodiaetus coelestina* Eversman (A.C.), a species which is little known and represented in few collections.

Agrodiaetus coelestina was described by Edouard Eversman in the Bulletin de la Société impériale des Naturalistes de Moscow, 1843, and in his "Fauna Lepidopterologia Volgo-Uralensis", published in 1844. His description may be translated from the Latin as follows:

"*Lycaena coelestina* Evm. Wings with white fringes — on the upperside blue with black margins (male), or brown with tawny lunules on the hindwings (female); on the underside grey, with a median streak and a single row of black spots: the hindwings bronzy from the base to the centre, marked in the female with up to four tawny marginal lunules. The sea-blue colour inclines to silver. Rather smaller than *L. acis*. In the female the lunules overlap from one space to the next. It inhabits bare, dry mountains near the rivers Sacaram, Ic, Taschla, etc, in the province of Orenburg; it flies in June."

Our specimens, some of which are shown on the colour-plate opposite, agree well with this description. The females, however, vary somewhat in the number and distinctness of the tawny lunules on both surfaces and in the darkness of the ground colour on the underside. We may add that the superficial features which best separate the species from *C. semiargus* Rott. (*acis* Schiff.) are, first, the brilliant shining blue of the males upperside; second, the heavy greenish scaling on the underside in both sexes; third, the even align-

ment of the spot in space 3 of the underside hindwings with its neighbours: in *C. semiargus*, and also in *C. helena*, this spot is sharply set back towards the centre of the wing. This detail is more obvious in the females of *A. coelestina* than in the males because in the latter the spot in space 2 may be missing; but the alignment of the spots in spaces 3 and 4 is still clear. Brilliant colour in the males and some greenish tinge in the scaling on the underside in both sexes may indeed be present in some races of *C. semiargus*, though never to nearly the same degree as in *A. coelestina*; but the even alignment of the spots on the underside hindwings is never found in *C. semiargus*. The male genitalia of *A. coelestina* are shown in the drawings by J.C. below. They differ greatly from those of *C. semiargus* and their form has caused modern authors to place the species in the genus *Agrodiaetus*, widely separated from *Cyaniris*.



Male genitalia of *Agrodiaetus coelestina* Eversman

Upper figure side view of labides, falces, aedoeagus, etc.

lower figure Ventral view, omitting valvae, vinculum, etc., which do not show good specific characters.

Herrich-Schaeffer included excellent colour plates of the upper and under sides of *A. coelestina* in his "Systematische Bearbeitung der Schmetterlinge von Europa", though there is no mention of it in his text, whose title-page is dated 1843, before Eversman's (A.C.) own work. The species was illustrated by Gerhard in his "Monographie" of 1853, and also, almost unrecognisably, by Lan (1884). Seitz (1907) figured the male upperside and the female underside, but in the former the colour is too dark a blue, and in the latter the greenish scaling is hardly shown. Of its distribution Seitz said: "In the South Russian steppes, at Sarepta, Orenburg, etc., and in the Caucasus". He added that *alticola* Christ is a smaller form from Armenia, with the ocelli of hindwings beneath obsolescent, the verdigris dusting occupying nearly the whole hindwing, with a broader border to the upperside forewing. W.G. Sheldon (1914) found *A. coelestina*, commonly mostly in poor condition, between 19th May and 26th June near Sarepta, on railway banks wherever there was a considerable growth of leguminous plants. Along with some of his specimens there are in the British Museum (Natural History) a few from Uralsk and Guberli, and a single worn male which is labelled "Shar-Deresy, N. Syria: native collector, 1900". Subsp. *iranica* Pfeiffer (1938) was named from the Elzburg Mountains in Iran, but we have not seen any examples.

The former Tsarist province of Orenburg lies at the south east of the Ural Mountains, on the extreme fringe of geographical Europe. Sarepta is on the river Volga a few miles below the city later made famous as Stalingrad. Even the Caucasus is a thousand miles east of the Greek Peloponnese. The discovery of *A. coelestina* there is therefore very surprising. Since as yet we know of only one colony, in a restricted locality where the species is apparently not abundant, it seems wise not to publish its precise position at present.

The colour plate opposite illustrates both *A. coelestina* and *C. helena*. The taxonomic position of the latter is still uncertain. First described by Staudinger in 1862 from southern Greece, it has been treated by most authors as a form or subspecies of *C. semiargus*. No differences have been detected in their genitalia, and the two are not known to be anywhere sympatric. The superficial differences are, however, so great that it is difficult to regard them as con-specific. *C. helena* is smaller than most, if not all, races of *C. semiargus*: it ranges from about 26 to 32 mms. in the males and from 25 to 30 mms. in the female. On the upperside, the males are of a paler, more violet, blue; and the females have four or more large orange marginal lunules on each hindwing and frequently up to three, more or less pronounced, on each forewing. On the underside, both sexes have a band of joined orange lunules on the hindwings, and traces of a similar band on the forewings are usually well developed in the females and frequently present in the males. It is true that in *C. semiargus parnassia* Stdgr. from the north side of the Gulf of Corinth

traces of yellow lunules are fairly frequent on the underside hindwings of both sexes; but these never form continuous bands as they do in *C. helena*. *C. helena* also has a weaker and more hesitant flight and looks very different from *C. semiargus* on the wing. Seitz, who treated *C. helena* as a form of *C. semiargus*, linked it with *C. antiochena* Lederer, which is found in the Lebanon and in Kurdistan. This has a similar pattern and degree of lunulation on the underside, but in the females the uppersides have a heavy suffusion of brilliant blue, of which there is no trace in *C. helena*.

C. helena has been found in several mountain areas of the Peloponnese, and has a considerable range of altitude, from at least 700 m. to 1,700 m. We do not know of any description of the larvae, and the food-plant is unknown. Clearly, more field study is needed before its relationships with *C. semiargus* or *C. antiochena* can be firmly established.

We are much indebted to Mr T. G. Howarth, of the British Museum (Natural History), who arranged for the production of the di-positive from which the colour plate has been produced.

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CLOSSIANA SELENE (Schiff.): SECOND BROOD — Prompted by the note by Mr R. F. Bretherton (*Ent Record*, 83: 352) I write to report a brood of 29 specimens bred out in August 1971. A female was caught on 8th June 1971; eggs were laid on or before 13th June and commenced hatching on 26th June. The larvae pupated between 23rd and 31st July and emerged between 3rd and 13th August. One larva did attempt to hibernate in July, but dried up in August. — A. S. WHEELER, Chelston, 18a Broadhurst, Ashted Surrey. 27.xii.1971.

Two Collecting Trips in Europe during 1971

(1) GREECE: DELPHI AND THE PELOPONNESE, MAY TO JUNE

by C. G. M. de WORMS, M.A. Ph.D., F.R.E.S.

Greece has always proved to most collectors who are fortunate enough to visit that lovely country, one of the richest and most interesting in Europe as regards its lepidoptera, especially as it is on the boundary where the eastern and western fauna meet with a number of species from the Near East finding their way into the mountainous regions of the Greek Peninsula. I had sampled Delphi and some of the Aegean Islands in April and May of 1963 (*vide Ent. Record* **75**, (234-238) I had always wanted to revisit this famous spot at a later date and the opportunity arose again in 1971. What made me especially keen to see some more of Greek butterflies was the list published of them by John Coutsis (*Entomologist* **102**, (1969), 264-268) and the illuminating accounts of his experiences in his correspondence to me from Athens.

Accordingly I set out from London Airport on 17th May, reaching Athens in the afternoon and having a small Volkswagen awaiting me, I motored the 120 miles to Delphi that evening, arriving well after dark at the new Europa Hotel which had kept me a most welcome late meal. This newly-built hotel looks out to the west and had some open verandahs whose walls were plastered with moths on my arrival to which I shall refer later, but among them I was glad to see a very fresh *Leucania vitellina* Hübn. Little, however, had changed in this resort since 1963, except that the hillside where the famous ruins stand had been wired in, as I had been warned, which made collecting on this ground far from easy. So, I concentrated on another area which had proved so fruitful before, a rough and rocky stretch down the road from the Castalia Spring and overlooking the Temple of Athene. This ground turned out specially productive on the morning of the 18th which broke with sunshine and warmth. Here *Papilio alexanor* Esp. was in abundance and a remarkable spectacle to see this grand insect careering over the rough terrain and occasionally fluttering on valerian, but never remaining still. However, many had been some time on the wing and it was by no means easy to obtain perfect examples or for that matter to net them. By far the commonest White was *Pieris ergane* Geyer readily distinguishable from its near relative *Pieris rapae* Linn. by its much more leisurely flight. I noticed too several Whites hugging the rocks obviously looking for egg-laying sites. In each instance these proved to be females of *Pieris krueperi* Staud. and on one occasion I actually saw one depositing on a species of arabis. *Gonepteryx farinosa* Zell. seemed to be the prevalent Brimstone, with a fresh brood just starting. There were also quite a number of *Melitaea trivia* Schiff., still quite fresh from the first brood, though mostly females, while *M. phoebe* Schiff. was

also fairly prevalent. The vicinity of the Castalia Spring seemed to be the usual beat for several *Polygonia egea* Cramer. The single Grayling obtained, a female, was later identified as *Hipparchia aristaeus* Bonelli. On May 19th I saw the first *Ipheclodes podalirius* Linn. and *Papilio machaon* Linn. as well as *Limenitis reducta* Staud. (*rivularis* Scop.) near Delphi, while an afternoon visit to Itea on the Gulf of Corinth provided some *Thecla spini* Schiff. in a rough flowery field near Khrisso. After my usual morning just east of Delphi, I motored after lunch on the 20th via Arachova along the new road which was being constructed up to the plateau just below Mt. Parnassus, but it was quite an ordeal negotiating some very rough stretches on this route. However, soon after I had ascended to the plateau conditions on the road improved and I eventually found a grassy bank where a lot of Blues were flying, especially among a species of astragalus. These mostly proved to be a large and very bright form of *Plebicula amanda* Schneider together with a good many *Cyaniris semiargus* Rott. in a very small form. *Leptidia sinapis* Linn. and *Anthocharis cardamines* L. were still flying at this altitude of about 4,000 feet. The Skippers were mainly represented by *Pyrgus armoricanus* Oberthur, by a large form of *P. serratulae* Rambur and also *Spialia orbifer* Hübn. The following morning of the 21st on a slope near my hotel I took the first *Melanargia larissa* Geyer and saw the first *Thecla ilicis* Esp. on my usual collecting ground to the east.

Another glorious day broke on May 22 when John Coutsis arrived from Athens before 9 a.m. and we drove via Amphissa to the wooded slopes of Mt. Ghionia, but little was flying except a few late *Anthocharis gruneri* H-S. and *Issoria lathonia* Linn. We returned via Delphi to some ground among olive groves near Arachova which was more productive with some late *Zerinthia polyxena* Schiff., also *Melitaea cinxia* Linn., *M. didyma* Esp., *Melanargia larissa* and we watched a *P. alexanor* laying on the flowerhead of a large umbellifer. Our final venue for the day was the Parnassus plateau which was again alive with Blues and Skippers. On this occasion we saw *Carcharodus orientalis* Reverdin, also a single worn female *Thersamonia thersamon* Esp., altogether a very energetic and profitable collecting tour for my last day at Delphi which, as already mentioned, produced a good assortment of moths mainly at the lights of my hotel. By far the commonest was the curious little Cossid which appeared also in the daytime, *Dyspessa salicicola* Mab. This insect appeared very numerous and in all sorts of variations in size and markings. Another plentiful visitor was the small *Catocola eutychia* Treits., a noted wanderer, while a very widespread species was *Grammodes stolidus* Linn. Among the geometers were *Scopula marginepunctata* Esp., *S. imitaria* Linn., *Anaitis efformata* Esp. and the large *Gnophus sartata* Treits. The only Burnet noted was *Zygaena punctum* Ochs.

On May 23rd in glorious weather I crossed the Isthmus of Corinth to Aegion from Itea, and then made my way up the

fine new road to the small town of Kalavrita in the Peloponnese which used to be reached by an 80-mile detour via Patras.

On the way up direct from the coast many *P. alexanor* were noted fluttering at thistles, but all well past their best. *Aporia crataegi* Linn. was abundant as also was *P. amanda*. The little mountain railway built in the 1880's still runs up the coast to this delightful mountain resort at 2,000 feet, where I was joined that evening by Russell and Jocelyn Bretherton who had come through from a week's collecting on the Island of Rhodes. As the main hotel in Kalavrita, the Mount Chelmos was not functioning we put up at the very nice Hotel Maria which was also the haven of Dr Schurmann and a colleague from Klagenfurt, but it meant taking all meals in the town. Another lovely day welcomed us when we set forth on a voyage of discovery on the 24th. We had good fortune early in that vicinity when Russell Bretherton caught a *Philotes bavius hungaricus* Dioszegy in the very spot that Gen. van Straubenzee took the original Greek specimen just 40 years previously. It was flying near some species of *Salvia* on which its larva is said to feed. Later on that day I secured two further examples of this rare Blue somewhat further afield. This second locality was alive with butterflies, including *G. farinosa*, *G. rhamni* Linn., *Plebicula dorylas* Schiff., in plenty, also *P. thersites* Cantener as well as the first *Cyaniris helena* Staud., that charming little Blue, at one time considered a subspecies of *C. semiargus* Linn., but easily differentiated on the wing by its much weaker flight and its habit of fluttering near the ground. The main Skippers were *Carcharodes alceae* Linn., and *C. orientalis*.

It turned out luckily a very fine morning on May 25 when we all motored up the rough and tortuous road that leads from Kalavrita up to the lower levels of Mt. Chelmos, the highest mountain of the region rising to over 7,000 feet. We halted at a spot among the fir forest and made our way on foot up a winding path to the large stony plateau beneath the main peak. During the hour it took to climb to this level of some 5,000 feet, which we reached about 10.30 a.m. we observed a galaxy of spring flowers, including several remarkable species of orchids and also a carpet of the prickly astragalus, the larval foodplant of that splendid insect, *Colias aurorina heldreichi* Staudinger. But we were obviously too early for it and most of the other high level species, though we saw a single *Parnassius mnemosyne* Linn. *Colias croceus* Fourc., was very prevalent and we took a few fresh *Anthocharis gruneri* H-S *Melitaea phoebe* and *Erynnis tages* Linn. Among other flora noted was large growth of the yellow tulip (*T. sylvaticum*) and a crocus near the snow-line. We returned to our base in the late afternoon. Yet another very warm day greeted us on the 26th when we visited the famous Hagia Laura monastery and collected in its vicinity. *M. didyma* was abundant on the grassy slopes with an occasional *Heodes tityrus* Poda, also *Philotes baton* Bergst. and another worn *Thersamonia thersamon*. The next day, the 27th, again very warm and sunny, Russell and Jocelyn Brether-

ton kindly took me in their car southwards on the precipitous road over the Aronia Neck which area was alive with *Aporia crataegi* in a large form. We then descended to the charming village of Aroania where a small watercourse provided 25 species of butterflies, including a lot of *Limenitis reducta* and several *Anthocharis gruneri* with a few worn *Cyaniris helena*. Near some further water along the road, west of Aroania we came across several *Libythea celtis* Larch in very fresh condition, altogether a very delightful day.

Early the next day, May 28, we headed southward again via Tripolis to cover the 100 miles to Sparta, seeing little of interest en route. We then travelled a few miles westwards to stay at the very well appointed Byzanteion Hotel at Mistras, noted for the ruins of its mediaeval city. Almost the first butterfly to greet was that grand Satyrid *Kirenia roxelana* Cramer flying near our hotel. Heavy rain fell that night and the first grey skies of my trip greeted us on the 29th, but these cleared about midday when we visited the famous ruins and found them an excellent haven for both sexes of *K. roxelana* which were darting about the walls and kept diving into bushes at the slightest provocation. Another feature of this remarkable locality was the profusion of the spectacular larvae of *Papilio alexanor* on a tall umbelliferous plant. They ranged from those just hatched to the very handsome full-fed creatures, some of which eventually pupated.

The weather improved considerably on May 30 when John Coutsis arrived at an early hour all the way from Athens and we set out soon afterwards up the Langada pass westwards across the Taygetos range. Until recently the road had been extremely rough and difficult to ascend, but we were delighted to find a very good-surfaced and widened route right to the summit at 3,000 ft. and on down the southern side. We broke off from the top of the pass along some forest tracks to the foot of one of the higher peaks. Here we found a torrent where *Clossiana euphrosyne* Linn. was flying with a large number of *Cyaniris helena* in which both sexes were fresher than in any place where we had met this pretty little insect hitherto. On the higher ground *Glaucopsyche alexis* Poda was flying with a large *Procris* species. Later that day in a dry river bed near Mistras we again found *K. roxelana* flying among high trees with *Celastrina argiolus* Linn. and many *Ochlodes venata* B. & G. The last day of May, John Coutsis conducted us up a steep mountain road leading from Mistras into the Taygetos to a village in one of the higher valleys where we saw a lot of *Polygonia egea* and some late *Callophrys rubi* Linn. On the way down I took a male *K. roxelana* flying on the cliff face. John Coutsis motored back to Athens that afternoon.

June opened with a glorious day when I set out with the Brethertons to the coastal resort of Gythion, en route we made two stops first near a bush covered hillside, where Russell Bretherton adroitly caught a fresh *Nymphalis antiopa* Linn., one of the most southerly records for this fine insect. Later

at a dry river bed we saw a number of *Gonepteryx farinosa* and *G. cleopatra*, a few *Limenitis reducta*, while *Thecla ilicis* was flitting round ilex bushes. We noted a single *Nymphalis polychloros* Linn. while males of *Maniola jurtina* were just appearing. After a refreshing bathe in the Aegean and lunch in Gythion we motored westwards to near Areopolis where on a bleak hillside *Melanargia larissa* was flying in a much paler form than further north. This Marbled White is extremely variable. We also saw *Pyronia cecilia* Vall (*ida* Esp.) and *Hipparchia aristaeus* Bonelli and a single *Philotes vicrama*. The following morning back in Mistras we parted company, the Brethertons heading for Athens and England, while I made my way again up the Langada Pass where on the summit near the very nice small hotel I once more found *C. helena* flying along most of the forest tracks. Then I made the steep descent on the good but very winding road to Kalamata, thence along the western coast road where I had to halt for a severe thunderstorm to pass. My route took me to Megalopolis and on over another steep road to the small town of Andritsaena. I put up in the very comfortable Xenia and went out in the evening to see the famous ruined temple of Apollo at Bassae perched high up in isolation on a mountain face. Another very fine day welcomed me on June 3, when I descended again stopping en route to sample the lepidoptera. At one spot near Karitena I found a large concentration of *Gonepteryx farinosa* and swarms of *Thecla ilicis*, also a few *L. celtis*, *G. alexis* and the first *Argynnis niobe* Linn. That evening I returned via Tripolis to Kalavrita, staying once more at Hotel Maria. A very fine day broke on the 4th when I made my way up to the plateau of Mt. Chelmos. This time *Parnassius mnemosyne* was about in force with an occasional *Aglais urticae* Linn. and *Polygonia egea* Linn. Not much else except *Colias croceus*, but no *C. aurorina*. Yet another warm day on the 5th when John Coutsis motored over from Athens. We had another very energetic tour revisiting our special haunt of the first days in this region, again with very good results. The first capture was a *P. bavius* as it rose from a clump of salvia. The species we had not noted before in this choice locality included *Pieris ergane*, *P. krueperi*, *Plebicula escheri* Hübn. also *Plebeius pylaon sephyrus* Frivalasky as well as the first *Pseudocharaza anthelea* Friv. besides all the other insects we had seen on our earlier visits. Later that day we made another ascent to the Mt. Chelmos plateau fortunately just as the sun reappeared after an overcast period. Once more *P. mnemosyne* was in abundance and John Coutsis was delighted to get a series of this local form, but in spite of diligent search there was still no sign of *Colias aurorina* which Dr and Mrs Higgins found in plenty there just over a week later. Several species we had not observed before were noted in particular *Polygonia c-album* Linn. *Pieris manni* Mayer *Aricia anteros* Freyer, already worn and *Syntarucus*

pirithous Linn. On the way down John Coutsis took a fine *Nymphalis polychloros*. He returned to Athens, some 140 miles that evening. I set out early on June 6 for that famous city, collecting on the downward road to the Gulf of Corinth, mainly a few more *G. farinosa* and *M. larissa*. After staying overnight in the centre of Athens, I went the next morning to see the very fine collection of Greek butterflies formed by John Coutsis with almost every species represented. That afternoon I flew back to England after a most delightful three weeks in this superb country with almost unbroken sunshine and a goodly harvest of lepidoptera of which we had recorded just 80 species of the butterflies.

Eumenis semele (L) *thyone* Thompson (Lep. Satyridae). A Microgeographical Race

By R. L. H. DENNIS

(Concluded from p. 11)

Aspects of the Great Orme Race

Two important points are associated with the Great Orme and adjoining populations, the overlap of characteristics and gene flow.

1. Gene Flow.—Gene flow between the Great Orme and Creuddyn populations has almost been certain in the past. Two features point in this direction. The first is historical. Prior to the 1860's, Llandudno was a rudimentary point on the map; the isthmus (16 ft. O.D.) consisting of sand blown onshore to form the tombolo, is believed by Embleton (1961) and Whittow (1965) to have taken place in historical times; the sand itself being the estuarine product of the river Conway. Prior to the construction of the town Llandudno, the sand dune formation would have allowed an unhindered morphological connection between the Great Orme and the Conway Morfa and Nant-y-Gamar populations. It is important to realise that with this connection, the Conway Morfa population would still have approached greater contiguity with the Great Orme population, the reasons being:—

(i) The Conway Morfa *semele* adjusted to the sand dune environment would have covered the whole range of the connection unbroken, but for the river break, from Conway Morfa to the junction with the Great Orme. However, Nant-y-Gamar *semele* adapted to the Limestone niche, would because of their close adjustment to that environment, and because of their colonial nature, have been unlikely to have contributed greatly to the Great Orme population, especially when it is remembered that a gap of 2,500 yards at least is involved, terrain consisting of a *semele* population likely to absorb any specimens from Nant-y-Gamar exposed by voluntary displacement. The Conway Morfa *semele* would, however, have been in

continual contact with *thyone*, allowing introgression.

(ii) The prevailing westerlies on the basis of a Flandrian climatic low zonal index (Willett), with a swing from south of west to north westerly approaches, would have allowed greatest interchange between the Great Orme *thyone* and the Conway Morfa *semele*. As the Nant-y-Gamar population is east of south from the Great Orme, anemochore dispersal effecting removal of occasional *thyone* would have contributed but little to that population.

In this way, the reduced characteristics of the Conway Morfa population have developed with time; also the Great Orme population must have acquired gene flow into its population. Prior to investigating this situation, it is of value to establish the length of time of operative gene flow, and perhaps the initial isolation of *E. semele* population on the Great Orme.

The *thyone* population is a geotype, highly adapted to conditions on the Great Orme in a past period, and currently also, though perhaps not to the same extent. As with *P. argus caernensis* Th., their isolationary locality is undoubtedly the Great Orme; the coincidence of these unrelated species demands this alone, especially their identical distribution. (Figure I). In a future work on the 'Establishment of North Wales Rhopalocera', it will be shown that it is significantly improbable (if not impossible) that *E. semele* could have survived Zone III of the Late Glacial in North Wales (10.800—10.200 B.P.), and certainly no glacial phase of the Upper Pleniglacial, the last dating 16.800—11.750 B.P. (Bryncir, Glanllynau, Llyn Peninsula; Saunders 1968). This would mean that *semele* arrived during the early Post Glacial, and was isolated on the Great Orme in a subsequent period. B. P. Beirne determined the necessity of a glacial phase for this isolation, an impossible suggestion, since the whole of N. Wales was covered by ice, and the Great Orme was so inundated even in Whittow's Stage III of the Weichselian Glaciation (post 16.500 B.P.) (Whittow 1969).

A probable period of isolation can perhaps be dated to the Flandrian optimum marine transgression (7.500—5.000 B.P.) or to the periods preceding or succeeding this. During this phase, (Zone VIIa Atlantic Period) the July mean was perhaps 4°F above the present value, and much of Britain was forested. In fact, the tree line would have risen 900 ft. (corroborated in certain pollen diagrams) or more. Whittow (1965) has established on the basis of raised beaches along the North Wales, Lancashire and Furness coasts, and on the important dated Gareg Lwyd (Anglesey) section, that a marine transgression, 16 ft. O.D., occasioned during the Flandrian optimum along the North Wales coast.

Embleton (1961) suggested that the old valley of the river Conway, from Glan Conway to Penrhyn Bay (see line of Creuddyn boundary in map, antea 82, 1970; p. 174) was flooded by this rise in sea level, segregating the Creuddyn Peninsula

from the Silurian mainland. "It also seems possible that the Great Orme's Head again became insular at this time for to-day the Llandudno tombolo stands at an average elevation of only 16 feet, and much of this height is due to the accretion of several feet of blown sand within historic time." (Whittow 1965). Yet ideas on the magnitude of this transgression may be altered with future research.

This would establish isolation of the *semele* population on the Great Orme, and perhaps the selection period, the nature of which as yet cannot be ascertained with any certainty. However, it may well be related to subsequent desiccation in the Sub-Boreal period, bearing in mind the pronounced evapotranspiration associated with the west side of the Great Orme. This would also necessitate spatial isolation. This area, now occupied by *thyone* and *caernensis* on the Great Orme was possibly one of the few areas without arboreal coverage, due to strong westerly gales and the instability of thin limestone soils on such steep slopes preventing tree growth. The existence of *H. nummularium* (foodplant of *P. argus caernensis*) is indicative enough that some part of the Great Orme as well as adjacent limestone areas was not forested. Gene flow was prevented by one or both of the above factors during this period, and was only initiated at some point in time post 5000 to 2500 B.P., once the tombolo had been constructed, and once any vegetative barrier had been reduced. This could mean that continued gene flow has obtained between *thyone* and contiguous *semele* populations for 2500 years, but likely for far less than this span of time. This function is now in the process of being swiftly negated, the reason being the continued urban growth of Llandudno along the west shore, and the utilization of the sand dunes for *H. sapiens'* recreation.

2. Overlap characteristics.—The second feature providing evidence for gene flow is contained in Figure 2. The dispersion diagram illustrates an almost complete segregation of Great Orme and Prestatyn *semele*, exemplifying the expected difference between such populations ensured by such an effective distance barrier. There is, however, a marked overlap of *thyone* with Conway Morfa and Creuddyn *semele* in all features; this is indicated by the zone between the 2 σ lines. reduction of Conway Morfa *semele* characteristics, when it is remembered that they should approximate those of Prestatyn *semele*. The explanation has been given above,—the continued genetic interchange along a contact zone throughout—at least—historical times. It is assumed then that this phenomenon has resulted in the overlap of characteristics between *thyone* and Conway Morfa *semele*, reducing the differences between those populations.

This has important repercussions for the Great Orme race, as E.B. Ford makes abundantly clear:—

"It is especially to be noticed that even a trickle of individuals from some main area would hinder the accurate build-up

of the gene complex required to fit a community to the peculiarities of a small locality. In the face of such immigration this could only be achieved by very powerful selection." (1964, p. 66).

Yet, the Great Orme race has managed to retain its identity, and it is important to assess the current ability of *thyone* Th. to establish its unusual features. Certain possibilities present themselves.

(a) Gene flow is a one way process towards Conway Morfa and the Creuddyn Peninsula.

(b) Selection pressures retain the integrity of *thyone* versus gene flow into the population.

(c) The gentic composition of *thyone* Th. presents a partial barrier to incoming gene flow.

(d) A proportion of the population (0.5 ± 0.2) with pure *thyone* characteristics emerge earlier than *semele* elsewhere, and retain their morphological characteristics by a process of temporal subspeciation.

(a) The chance of a one-way gene flow process seems highly improbable; not only is this thesis negated by pronounced possibility of anemochore dispersal into the *thyone* population via strong westerly winds in June and July, but also a contact zone would require voluntary displacement in either direction from the contact. Yet, some argument may perhaps indicate a *thyone* exodus excess, demanded perhaps by the higher frequency of northwesterly gales, provoking unidirectionalism. However, voluntary displacement would take place at a constant frequency along the line of junction, and is probably not persuaded in either direction by wind directional preferences.

An important facet to be expanded later, is the relationship of *thyone*'s morphological characteristics with sections of the flight period. This association was discovered this year, when the writer was able to sample the population in mid-June. On addition of the 1971 values to the 1969/70 figures, the means of spot size and wing expanse were reduced. In fact, the differences between the mean wing expanse figures quoted here, and those given by J. A. Thompson is probably associated with the fact, that the writer has been unable to sample early enough in the flight period. As the flight period progresses, *thyone* specimens assume more the morphological characteristics of Conway Morfa *semele*. This is a certain indicator that gene flow enter the *thyone* population from Conway Morfa, and would denounce any unidirectionalist theory.

(b) As mentioned above, in the face of gene flow, high selective pressures would theoretically be required to stabilize *thyone* racial features. This is a definite possibility, if not a necessity. Prior to 1940, selective advantages were believed to be no greater than 1%; they are now known to commonly exceed 25% (Ford 1964, p. 32). It is certain that Great Orme *thyone* are well adapted to the west side of the headland; the distribution of both endemic races (Figure 1) indicates this. Certainly there is a selective advantage for *thyone*, for

neutrality or negative conditions would have reduced it to extinction. Yet, it can only be suggested here what the selective pressures might be, or might have been. They could well have been related to extreme evapotranspiration on the Great Orme. Certainly the distribution of the two races would suggest this. First of all, the southwesterly and westerly sides receive the greatest insolation in the Northern Hemisphere (Geiger 1968), secondly, the isohyets are depressed markedly from Snowdonia towards the Great Orme to give 30 inches of rain each year on the headland; finally, the constant westerly gales on this exposed west face, coupled with the limestone lithology increases evapotranspiration, percolation and thus desiccation of vegetation on the steep slopes. Yet, there is no correlation of these factors with *semele* size east to Prestatyn where the rainfall total, lithology and other factors are similar. (Moel Hiraddog). However, the fact that there is no correlation of *semele* facets with desiccation criteria does not preclude this explanation entirely; since it may well have been that *semele* became highly adapted by a unique genetic fixation to extreme desiccation on the west side of the Great Orme, where it survived such a period; but that elsewhere, it became extinct on the limestone, or has since become extinct. The retention of its characteristics would then be explained by the slight advantage offered to *thyone* on the west side of the Great Orme, and its temporal segregation from the nominotypical form. It is interesting, that *semele* colonies in North Wales, and perhaps elsewhere, are invariably on west or south west facing slopes, even in respect of the fact that they are thus usually exposed to continual gale force winds. W. J. P. Mears has also noticed this disregard or attachment to wind swept slopes in South Devon.

Detailed work on the early metamorphic stages of *thyone* and *semele* may establish the nature of the selective pressures and the genetic situation, and would certainly test E. B. Ford's suggestions on the genetic factors involved.

(c) It is to be doubted that the genetic composition of *thyone* Th. presents a partial barrier to incoming gene flow. There is little evidence to suggest this. The genetic factors that contribute to *thyone* are perhaps slight, and not of the order to suppress hybridization.

(d) A central feature of *thyone* Th. is its early emergence, and thus relatively early flight period compared to nominotypical *semele*. This means that for half its total flight period, it is isolated completely from Conway Morfa *semele*. Emergence on the Great Orme usually begins before the 10th June, but when environmental factors interrupt the emergence sequence there, a similar occurrence usually obtains on the Creuddyn. This means that high selective pressures on the Great Orme are not entirely necessary to retain the integrity of *thyone* Th., for it can do so by a system of temporal subspeciation. This theory has been developed in an earlier issue (antea 83, 207) by the writer and obviates repetition here.

An important question demands the nature of the genetic controls on this race. E. B. Ford, forwarded a simple monogenic theory, involving a single gene that speeds up development, so that smaller imagines emerge at an earlier date, the larvae not having attained full growth; it was a suggestion based on an understanding that dwarf *thyone* Th. on the Great Orme "comprises the whole population."

It must be borne in mind that there is not just the matter of reductionism involved in *thyone*; coloration and marking facets are differentiated in addition, but are difficult to express in an objective manner (antea 82, 104 and 168). Some of these latter facets may, however, be purely environmental, but a glance at a series from Rhyd-y-Foel, Moel Hiraddog, Nant-y-Gamar and Bwrdd Arthur (limestone environment) suggests that *thyone* coloration and markings are endemic to the race.

There are perhaps two possible explanations:—

(a) As E. B. Ford suggested a simple monogenic situation may exist, which speeds up or breaks the ontogenetic sequence, with composite effects, but creating an overlap with contiguous populations in the manner held above. This is the more likely explanation.

(b) There is the possibility of a polygenic situation involving two or more genes, perhaps with close linkage. Certainly this situation allowing selection to operate on continuous latent variation would have allowed more rapid adjustment of *thyone* to local conditions during the period of its formation.

It is, of course, all the more remarkable that *P. argus caernensis* reveals an identical stenocious limitation, indicating that both races have undergone the same selective pressures during a past period. This gave the writer every reason for seeking a general environmental factor such as the severe desiccation of the food plants at some point in the year (May/June), perhaps in the last larvae instar, a highly probable occurrence on the Great Orme. This would select for gene(s) establishing early emergence and reduced size in the two species. Again, this suggestion reflects on the Boreal and Sub Boreal periods, when the continental climate would certainly have reduced the Great Orme to more than its usual desiccated appearance.

The writer is grateful to R. G. Payne for directing his attention to another isolated colony of *semele* in the Malvern Hills displaying dwarfism; the measurements of the males being well below that of the *thyone* mean. This colony, and perhaps one on Hutton Roof Crag in Westmorland discovered by the Rev. J. V. Hall indicates that conditions producing *thyone* sized populations can recur in different areas, though of course, this does not suggest for a moment that the same genetic factors are involved.

In the preceding paper on *E. semele thyone* Th., it was indicated that G. Ellis pointed out, that a dwarf form of *semele* occurred on the hillside above Glan Conway. It appeared un-

likely to the writer that this population was referable to *thyone* Th. However, Dr J. F. D. Frazer kindly informed the writer that he had a series of these insects supplied to him by G. Ellis, and that they were of the general size found on the Creuddyn Peninsula.

I extend my gratitude to Dr J. F. D. Frazer, Mr W. J. P. Mears, Mr H. N. Michaelis and Mr R. G. Payne for information supplied; to Mr A. Brindle for kindly setting out series of *E. semele* in the Manchester Museum for inspection; and to Mr E. Drouet for providing me liberally with Grayling specimens from various localities in France.

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The Burren, May 1971

By E. A. SADLER

(Concluded from p. 18)

That evening, we once again gathered at Doolin, where what seemed to us a nearly perfect night, cloudy, wind-free and warm, was in the offing, and with high hopes, we positioned our six lights along the by now familiar shore, but, as all too frequently happens, what seemed an ideal night to us, did not make the moths go wild with delight. Our intake by midnight being very poor (though by then we had still managed to take five *caesia* between us) and the cloud cover having dispersed, we agreed to leave the lights burning the rest of the night, hoping things might liven up before dawn. After making sure our three generators had enough petrol, we left them to their own devices while we returned to our hotels and bed. R. and I were up early next morning and back at Doolin by 6 a.m., where we were disappointed to find that despite the remainder of the night having remained calm and warm, the only additions to our intake were a male *Macrothylacia rubi* L., which must have been on an unusually early flight; two *Laothoe populi* L. and an *Eustrotia uncula* Clerk, both of

which species seemed in a most unlikely spot with no trees or marsh in sight. We packed up the lights and after breakfast met M. at the Ballyvaughan traps, which, bewilderingly, were crammed with moths. Among these were some nice dark forms of *Anagoga pulveraria* L., several very pink *Hadena contigua* Schiff., and a few *Ectropis crepuscularia* Hüb.,; and the only example of *Perizoma albulata* Schiff. we were to see during our stay. *S. lunaria* and *salicata* were common, and *C. mendica* ab. *rustica* was for the first time in good numbers, all being males, among which I took a specimen with a grey suffusion over a large part of the hindwings.

We now made another visit to Newtown Castle, where *sinapis* was again flying well in the sunshine. M., who was on the lookout for such things, found a web of larvae on a small blackthorn bush. Both larvae and web were fairly small but a close inspection showed them to be of *Eriogaster lanestris* L., which pleased him as he had not met this species before. A closer look round this area produced more webs, all low down on small hawthorn or blackthorn bushes standing alone in the open, and not on hedges as they are in Dorset. We noticed other webs elsewhere in the Burren after this, probably having previously dismissed them as small pieces of sheep wool caught in the thorns, with which these as yet undeveloped webs could easily be confused at a distance. We took a web each, from which we now have numerous cocoons, and it will be interesting to see whether this species, when it emerges, differs from English specimens, as so many other Burren species do.

After lunch, with the sun still shining, Fanore Strand was revisited, where we hoped to find that a few early *purpuralis* had been encouraged by its warmth to emerge, but after a brief inspection, in which we saw none, we again resorted to grubbing amongst the moss for cocoons, finding another half dozen for a lot of effort over a long afternoon. After this, we decided that there must be an easier way of obtaining our series than this, and I could not help feeling that we had somehow missed the main breeding ground, although we had by now sampled all the areas where the foodplants, thyme and trefoil, grew abundantly, and we pondered this problem without arriving at a solution as we drove back to our hotels.

We descended on Doolin that evening at dusk, the nearby local inhabitants having by now become used to our two identical Avengers arriving each night, and their dogs, mainly of collie-type ancestry, ceased nipping at the heels of the cars, and continued their sleep, which, we found in the Burren area, usually takes place in the middle of the road. Here they lie as one drives around them or sit defying the car to touch them, as if they believed it to be some kind of robot cow or donkey. Considering the large quantity of both these animals that seemed to make these narrow, walled lanes their home, perhaps the dogs can be excused their attitude. The people

of the area, I might add, were friendly without exception, which we eventually found embarrassing, as we repeatedly had to acknowledge the cheery waves of young and old as we dashed about from place to place, in fact it became so arm-tiring that R. and I, who were taking it in turn to drive each other about, considered appointing a duty waver each day, as well as a duty driver! At Doolin we found a stiff breeze was blowing, but by carefully siting our lights in rocky hollows, we were able to miss the worst, and get a fair intake for our trouble, though unfortunately, our main quarry, the elusive *caesia*, was again not really trying to grace our cabinets. We packed up at midnight because of strengthening winds, with only two specimens, and I also took the only *Apatele menyanthidis* View. of our holiday.

The following morning, as we had become accustomed to expect, there had been another good intake at the traps overnight, though we found little in them that interested us any more. With the weather again bad, we decided to visit Moheramoylan to try to locate the extensive beds of mossy saxifrage, which we understood grew thereabouts, on which, I had calculated, we should perhaps be able to locate larvae of the third plume specialty of Ireland, *Stenoptilia saxifragae* T. B. Fletcher at this date. By following a lane marked Moheramoylan on our map we found ourselves at a dead end in someone's farmyard, and though we had noted odd clumps of saxifrage growing along the roadside verges on the way, we now found ourselves surrounded by grassy fields, which looked most unpromising. Suddenly, through the drizzle, we saw a small figure at the top of a nearby mountain, who was waving what appeared to be a black net. Without more ado we hastened over the intervening fields and up the slope to catch up with this supposed entomologist, who might well be able to assist us. I was disappointed to see that the man was, in fact, a local, the net being, of all things, a large umbrella. As I approached I could hear him informing someone I could not see, who was over the steep edge, that I was coming. I passed the time of day with the gamp-wielder and explained my mistake and asked him if he had ever seen collectors here before. He had not, and neither had his companion, who by now had clambered up to join us. Trying a different tack, I asked if they could tell me where saxifrage grew, but it was soon apparent that these two knew nothing of the local plants when they pointed out some milkwort flowers at our feet as a Burren specialty! While this unrewarding conversation was taking place, I could see my friends inspecting an area covered with white flowers, and thinking that they had discovered what we were seeking, I hastily bid these curious characters adieu, and left them to continue whatever they were supposed to be doing on this mountain top in pouring rain, rather pleased to think that we were not the only idiots to be in such a situation. On rejoining my companions, I found they were among extensive beds of mountain avens, but as we wandered back across

the top on our own way down, we discovered a few mossy saxifrage plants growing under a low stone wall. M., more I am sure, as a last resort, knelt heroically among the wet plants, asking as he did so what *saxifragae* larvae looked like. I had hardly finished explaining that it was green with red stripes, when he pointed out a nice plump specimen marching along the prostrate leaves, and R., who had been examining another plant found a slender reddish pupa, which was obviously of this species, but which had unfortunately been flattened beneath someone's foot. Throwing all thoughts of future rheumatics aside, we were by now all on our knees, R. finding a second and this time undamaged pupa attached to a leaf. We both found a number of larvae in a wide variety of sizes, and ranging in colour from yellowish green to quite pink examples. M., on the other hand, after his initial success, had only located a few more, and when R. was heard to complain that the rain was misting up his glasses, M. quickly retorted "you should worry". We were by now wet and cold, and as we had searched all the available plants, we decided to go back and look at the plants we had seen on the approach road, where on this lower level, we could get some relief from the strong wind. Back at the farmyard, we found the farmer peering from his doorway, probably puzzled at our intrusion, but wet as we were, we had no inclination to stop and chat, and diving gratefully into our Avengers, we drove off to the roadside plants. These, at first glance, seemed devoid of life, but I eventually spotted a larva on a flower head, and we were soon finding them in numbers, high up on the flower stems, and we quickly arrived at the quantity we needed. We packed up and were soon on our way back to our hotels and dry clothes, very pleased to think we had managed to get one of the Burren's plume specialties. We each later bred a series from these larvae.

M. joined us at dusk at Lisdoonvarna, but it was obvious such a cold and windy night would be hopeless at Doolin, so we drove to Newton Castle, where I ran one token m.v. while we searched for larvae, but we found nothing, and with nothing at the light, either, we called it a day at midnight.

The traps at Ballyvaughan the following morning also reflected the bad night, with a poor intake. As M. had to leave for Dublin at dawn the following morning in order to catch his plane, we assisted him to pack up his two traps. Whilst doing this, I again found a *purpuralis* larva, which took us to Fanore Strand as soon as we finished here, for yet another try for this common Burren species, which was proving so difficult to obtain. While we three were engaged in our moss scratching routine for a few more cocoons, M.'s family who had accompanied him, and who, we thought had gone to the nearby beach, had instead hit upon the main *purpuralis* colony, as we soon discovered when a representative arrived clutching a pillbox, thoughtfully provided by M., which was stuffed with cocoons and a few larvae, which they had found

with little effort. We hastened to their lucrative spot, finding it similar to several other flat pavement areas we had previously inspected without results. This one seemed little different, except that it was larger, with, if anything, much sparser covering of plant growth than most. A small amount of trefoil grew from crevices, and thyme grew mainly on a few ant hills dotted about, yet *purpuralis* cocoons were abundant and only partially hidden beneath this spartan plant life, and we quickly gathered all we required. Then one of us casually turned over a loose stone, we were amazed to find it encrusted with *purpuralis* cocoons and *irrolella* pupae, all jumbled up together, and many other stones were found to be equally infested. Imagines of the latter were also found on the wing, but it was some days after returning home before *purpuralis* began emerging from our cocoons. We all succeeded in rearing a series of this rather poor looking burnet, which appears worn even in mint condition.

Elated by our success, we now visited the nearby slopes of Mount Gleninagh, where we netted a few more *C. minimus* before the wind and rain, which had bothered us for most of the holiday, started up again, and we retreated hastily to the cars and lunch, after which M. left with his family to do some shopping. As we sat deciding what our next move could be, the bad weather rapidly cleared, and we spent a pleasantly hot afternoon at Newton Castle, where *sinapis* was again every where, my companion doing particularly well, considering the boulder-strewn terrain, by netting the only *Hemaris tityus* L. we were to see, and *Euphydryas aurinia* Rott. and *Epirrhoe tristata* L. From a few specimens of each which we saw, the latter, which was, luckily for me, a female, was kept for ova, and we reared a series each of this very black and white form (which was a new species for me) in July, only a few pupae overwintering. We also gathered spun burnet rose shoots here, from which we reared a number of the pink flushed *Notocelia incarnatana* Hübn., and a few *Argyrotoza bergmanniana* L.

A cold, windy night put any thoughts of m.v. work from our minds, and the poor intake at the trap the following morning proved how right we had been. We reflected that M., who was by now well on the way to Dublin, had not missed much. We now had the unhappy task of packing our trap up as we would be returning home ourselves early the following morning. Thanking our crofter friend for allowing us to plug in, we bade him goodbye and departed, though we stopped to walk up the field near his house before leaving the area, and I was pleased to net a few examples of the local *Cochleophasia pubicornis* Haw. here before we left to visit Blackhead for the last time. Here we clambered about the shore line admiring the clear rock pools, in which various coloured seaweeds, sea anemones, and shells lived, and we noted a number of empty purple-spined sea urchin shells lying about the rocks, whose contents, we guessed, had been eaten by seagulls. R. and I wandered apart as we explored, and looking back to where he

was I saw a coachload of American tourists stop and disembark on the coast road just above him. He told me when we joined up again, that several very determined elderly ladies from this party had climbed down these dangerous rocks in an attempt to take his photograph, mistaking him, no doubt, for a colourful rock-hopping local, but he was not keen on being immortalized in this fashion, and managed to thwart them, (rather ungallantly I thought), by keeping large rocks between himself and their lenses. While all this was going on I discovered a marvellous piece of branched coral embedded as a white crystalline fossil, hand sized with fingers extended in a huge boulder. We watched a large dog stoat working in agile fashion along this rugged shoreline, but were not fortunate enough to see any pine martens during our stay. Several locals to whom I spoke had seen them within the past few years. Indeed apart from a few Irish hares, we saw no other wild animals on the Burren.

The sun came out at mid-day, and I seized this opportunity for photographing Fanore Strand, where, in a fault in the flat rocks I chanced upon a ringed plover's nest, which was just a shallow sandy hollow, decorated with small bleached snail shells, containing three chipping eggs and a newly hatched grey chick, with the parent bird watching anxiously near by, I took a hasty picture and left. While I had been so engaged my friend had been inspecting the main *purpuralis* colony for a last check to see whether the species had started emerging, but when I rejoined him, he had not seen any. So we left for the flowers on Mount Gleninagh, which I also wished to photograph before the sun disappeared. As we passed Slieve Elva, I noted five black birds flying about a cleft near the top, which at that distance looked like the nearest thing yet to a chough, so we stopped to climb up to what I hoped would be a nest site, but before getting half way I realized the birds were ravens, and although we continued to climb in drizzle, we were unable to negotiate the cleft in safety because of wet footholds so we made our way down. On the way down, we noted some mossy *saxifragae* larvae in a locality some miles from Moheramoylan, and we concluded from this that it is a widespread species on the Burren, and could quite easily have been transferred on plants removed from here to the gardens of Dublin. We noted that a plant of a different species of saxifrage, gathered in haste in mistake for the correct food plant, to take home with us, was readily accepted as an alternative, and we found that the larvae were particularly partial to the white flowers of both species. Not realizing two species of saxifrage grew in the area we had no chance of checking whether this plume feeds on both in the wild, but in the confinement of a garden, with closely allied plants perhaps at hand, one could well imagine it doing so.

Returning to our hotel early, we did some packing, and after dinner, I visited the impressive Cliffs of Moher where I hoped I might see the elusive chough, but apart from a colony

of kittywakes I saw nothing. I left for Doolin Strand to check how bad the wind was, and in doing so saw perhaps the best new bird of the holiday, when at around 9 a.m. two small flights of rock doves followed each another past me and swept low out to sea, heading in the direction of the cliffs I had just visited, where I guessed they roosted at night. Though the wind was very strong, I believed it would be possible to have one last attempt at *caesia* that night, and reported this to R. on my return, so dusk saw us again at Doolin where we ran four m.vs. until 12.30 a.m. getting one more *caesia* for our trouble from the few moths which came in, bringing our total for the holiday to sixteen. This was not enough to give a series each, but we felt this was only because of bad luck with the weather. In any case we had an excuse, if one were needed, to return again another year to this attractive area, to tie up the loose ends of this and other species we failed to get to grips with.

After only a few hours sleep, we were up again at 5 a.m. leaving for Dublin an hour later and arriving at the airport in good time to hand back the car and board the 11.30 aircraft for Bristol, where we found the Easter holiday traffic bumper to bumper on the roads, a sharp contrast with the empty roads we had just left behind. We had observed, however, that even in a remote place like the Burren, the wind of change was blowing; an area of several acres of freshly bulldozed ground at its centre showed where another section of typical Burren had succumbed to the interests of better farming. On a more ominous note, perhaps, were dead roadside verges (in only a few places, admittedly for the moment) where weed killing sprays had obviously been used; a dangerous game to play with such a unique landscape.

St. Christopher, West Tisted, Alresford, Hants.

Correction

In the article on *Maniola jurtina* L. A Breeding Experiment (*Ent Record* **83**: 333) the penultimate paragraph on p. 335 should read:—

“All these pupae hatched towards the end of June and all produced female butterflies, about one quarter of which were *excessa* forms in varying degrees. There were no males and no sign of *ab. atrescens*. The two larvae that failed to pupate at the same time as the rest of the brood eventually died. In desperation I tried to get a mating with the last two females to emerge, using wild males, but I was unsuccessful, as no observed pairing took place although the conditions were exactly the same as for the previous summer.”

Nomenclatural Corrections

By V. C. KAPOOR.

(Punjab Agricultural University, Ludhiana, India.)

There is a wide confusion regarding the usage of the species *Heliothis armigera* (Hübner), and *Heliothis obsoleta* (Fabricius). Some consider that these two names belong to the same taxon. In 1968 (Anonymous, Crop Protection Courier, Vol. 8, "Bayer") *Heliothis armigera* and *Heliothis zea* Boddie were considered as synonyms of *Heliothis obsoleta*. Hardwick (1965, *Mem. Ent. Society, Canada*, 40: 9) erected the new genus *Helicoverpa* for the type species *Noctua armigera* Hübner. Recently (1970, *Mem. Ent. Society, Canada*, 73: 59) he treated *obsoleta* Fabricius and *umbrosa* Grote as synonyms of *zea* Boddie under *Helicoverpa*. He differentiated *Helicoverpa* from *Heliothis* by the possession of multi-coiled vesica in the male genitalia and an alternately dilated and constricted appendix bursae in the female genitalia of the former. So the present existing names of the two species should be *Helicoverpa armigera* Hübner and *Helicoverpa zea* Boddie (= *obsoleta* Fabricius).

The Nomenclatural Status of Cotton Jassid, *Amrasca devastans* (Distant)

By V. C. KAPOOR, and A. S. SOHI

Department of Zoology-Entomology, Punjab Agricultural University,
Ludhiana, India.

Ghuri (1967) transferred the Indian Cotton jassid, *Empoasca devastans* Distant 1918, to his newly proposed genus *Amrasca*. Later Dworakowska (1970) proposed a new genus *Sundapteryx* for the type species *Chlorita biguttula* Ishida, 1913. She has also synonymised *Empoasca devastans* Distant with *Sundapteryx biguttula biguttula* (Ishida), 1913, without mentioning Ghauri's new combination. When a new genus *Amrasca* has already been accepted widely and *Empoasca devastans* has many common characters enough to put it in *Amrasca*, there is full justification that the cotton jassid should be placed in *Amrasca*. Since the *biguttula biguttula* has priority over that of *devastans*, the correct name of the Indian Cotton jassid should be *Amrasca biguttula biguttula* (Ishida, 1913).

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Notes on the Discovery of the Larva and Pupa in Britain of *Gortyna borelii* Pierret : Fisher's Estuarine Moth

By J. M. CHALMERS-HUNT

Mr J. B. Fisher was the first to find this species in Britain, when he took a single specimen in an m.v.l. trap in September 1968, and in 1970 had the good fortune to take two more examples at light. It was not until 1971, however, that a record of these captures was published (Fisher, 1971; Jacobs, 1971).

Kirby (1903) gives *Peucedanum officinale* L.: Sea Hog's Fennel as the foodplant of *borelii* on the continent. This is an erect perennial umbelliferous plant with a very stout and woody root. It occurs as a native in Britain, but is restricted to a few localities only.

Mr Fisher kindly showed me a station where *P. officinale* is locally numerous, and in early August 1971 I visited the locality twice, and from the start soon found signs of larval feeding.

The larva feeds in the base of the stem and solid root, sometimes boring down into the latter to a depth of nearly a foot. It ejects piles of coarse pale-straw frass, which forms in a heap on the surface of the soil around the foot of the plant. Affected plants showed distinct signs of wilt, and some appeared moribund or actually dead from having been killed by the ravages of the larva. Judging from the numbers of affected plants seen, *borelii* appeared to be quite plentiful at this locality.

A single pupa was found situated head upwards in the rhizome. It had no cocoon, nor was there any apparent sign of silk covering.

In order to avoid the risk of any appreciable reduction in the strength of the colony, I decided to collect only five larvae and the one pupa already mentioned, and owing to the relative scarcity of *P. officinale* in Britain, to select only from dead or dying plants.

The roots containing the larvae I placed in cylindrical cages and partly covered them with soil. I later offered one larva a root of garden carrot. It fed well on this and indeed seemed to relish it.

In September six moths emerged. The first appeared on the 7th and the rest as follows:—17th 18th 25th (2), and 27th. Apart from one which was crippled, their wing expanse ranged from 48-57 mm.

I am indebted to Mr G. M. Haggett for the following abridged description of one of my larvae when in its final instar on August 5th:—

Length 50 mm. Body cylindrical, smooth, dully shining skin, ground colour waxy cream, heavily suffused smoky purplish along the dorsum, with heavily chitinised black lateral warts and weaker black dorsal warts. Spiracles black. Head ginger-red, prothoracic plate ginger-brown marked with black at each

side, anal plate black and heavily chitinised, a belt of black chitin on the preceding ring. True legs black, prolegs cream with a weak dark bar above.

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Notes and Observations

INFURCITINEA ARGENTIMACULELLA STAINTON (Lep. Tineidae) IN SURREY.—On the 23rd of August 1971, I was in the vicinity of Albury, near St. Martha's Hill, Guildford, when along the edge of a road I noticed cavities and overhangs of sandstone about which were growths of lichen. These aroused my attention, and, having become well acquainted over the years with the particular habitat of *I. argentimaculella*, I decided that they were worth my inspection. After a while, and in several places, I found almost certain evidence that the moth is established in the area. The imago itself was not present, it being a July insect, but the thin silken tubes were pretty clear on the surface of the lichen. I know of nothing else that produces these tubes.

I. argentimaculella has been recorded from Surrey in the past, and probably exists in other suitable localities in the area. I hope to confirm its presence by finding the moth this year. This species is probably much more widespread in the country, but is overlooked because of its secluded habits.—E. S. BRADFORD, 38 Oakwood Avenue, Boreham Wood, Herts. 30.xii.1971.

NEPTICULA MYRTILLELLA STAINTON (LEP. NEPTICULIDAE).—Lieut. Col. Emmet in his notes on the Nepticulidae (*Ent. Rec.*, **83**: 302 and 303) omitted to give Cornwall as a locality for this species. I have found vacated mines at Hensbarrow Downs, near St Austell at odd times between August and October both in 1969 and in 1970. The mines are nearly always in a lower leaf of a stalk of *Vaccinium* (bilberry), and they are usually characterised by the purplish colouring of the leaf which he describes. I suggest that this may be a new county record.

From several tenanted mines which I gathered in the autumn of 1970, I succeeded in rearing only one moth, which emerged in May 1971.—J. L. GREGORY, 17 Grove Road St Austell, Cornwall. 3.xii.1971.

THE 1971 SEASON IN SUFFOLK.—Your note (83: 252) caught my attention. I have missed not having many observations to read recently. From my experience his year, I should say that the season has been so bad that there has been little to write about, and several collectors have given me the same information. I have had larger numbers of moths in my trap (M.V.) run here this year than ever before, but the rarer species have been almost completely absent.

Last year, I took some quite interesting species such as *chamolillae*, *alni*, *festucae*, *porcellus*, *leporina*, *cuculla*, *flammea*, *corticea*, *leucostigma*, *dissoluta*, *compta*, *geminipuncta* (1) possibly a new record for Suffolk, *helvola* and *subtusa*. But this year the only species of note were *obsoleta* (1), possibly new to west Suffolk, *cuculla* (1), *porcellus*, and *dis-similis*. There were no signs of *ophiogramma* or *autumnaria*, quite numerous in 1969. However, I took one moth this year which, after forty years of collecting, I simply cannot identify. If I do eventually find it to be something of real interest I will send the information.

In conclusion, over the years I have collected a great number of spare specimens which I would be very pleased to dispose of. Some are moderately rare and most are in good condition. I would gladly give them away, also some collectors could offer me some specimens in exchange. There are quite a number of fairly common species found in Surrey, Sussex, Hants, etc., which I have never been able to obtain. One species in particular of which I have taken two specimens is *agathina*. I would also very much like to receive a few specimens of *praecox*, *nubeculosa*, *cannae*, *sponsa*, *promissa*, *coracina*, *limacodes*, *asella*, *irrearella* and *rubricollis* among other species I have never taken any of these myself.—Rev. GUY A. FORD, The Rookery Farmhouse, Norton, Bury St. Edmonds, Suffolk. 6.xi.1971.

GONOPTERYX RHAMNI L.: AN EARLY SIGHTING.—On Boxing day, 27th December 1971, I observed a male *G. rhamni* flying in my back garden. This is the first time I have seen *rhamni* flying in December, and no doubt its appearance was due to the mild weather conditions prevailing at the time. — M. R. LONGDON, 158 Ravensbourne Avenue, Shortlands, Bromley, Kent. 10.i.1972.

ABUNDANCE OF YPONOMEUTA PADELLA L. (LEP. YPONOMEUTIDAE): In May 1971, it was brought to my notice by Mr P. Goddard, who was then on holiday in Cornwall that there was a plague of *Yponomeuta* larvae at Polruan, so a few days later I went to investigate. A local resident informed me that the caterpillars were just above the "Washing Rock" where there

was a large area covered mainly by low, scrubby blackthorn bushes. On arrival there I noted that perhaps about a quarter of an acre of these blackthorns had been completely defoliated and were covered by the characteristic silken webs of the caterpillars, even the odd grass tufts and the wild cabbage plants were shrouded with the web, giving the whole area a frosted appearance when seen from a distance. The black-spotted grey larvae were literally swarming everywhere in a vain search for more food, all the available supply having been consumed with the exception of a few very small bushes at the edge of the area, on which grossly overcrowded larvae were busily feeding. Walking down the steep path which leads to the rocks one was forced to trample on the swarming hungry caterpillars.

A similar phenomenon occurred above Whitsands Bay in the summer of 1965, but on that occasion I was a little too late in the season to see the larvae. This year the species has been unusually common on blackthorns in other localities along the south Cornish coast, several single "nests" of larvae having been found near to Polruan, at Chapel Point, and Gorranhaven, also a number of others around Portscatho. But none of these single nests did much more than defoliate an odd branch or two of the blackthorn.

It is a mystery why so many moths of this species should choose to lay their eggs in one small area in one year and to ignore it in another, when there is an abundance of available food supply in the vicinity.—JOHN L. GREGORY, 17 Grove Rd., St Austell, Cornwall, 30.x.1971.

Obituary

CHRISTOPHER GUY FARWELL

On the 5th April 1971 Christopher Guy Farwell (affectionately known as "Pop") died at the age of 85.

Pop started collecting at a very early age. On moving to London where he worked for 17 years he became interested in foreign lepidoptera and became quite an authority building an interesting and varied collection.

In 1919 he married and moved to Brockenhurst. At that time he had the opportunity of breeding and collecting under very different conditions than the New Forrest of the present day. As his son, Ian grew up showing the same interests breeding and collecting continued on a larger scale but always with the accent on conservation.

During the depression of the thirties he was forced to sell his foreign collection and although this must have been a terrible blow he continued helping and encouraging his son and other entomologists particularly of the younger generation.

During the 1939-45 war he had the New Forest almost to

himself acquiring some fine camilla and paphia aberrations the latter now being in our collection. After the war he started a local group of entomologists who met regularly for discussions.

It was in 1945 that we first met Pop and my most vivid memory is of Pop mounted on his faithful bicycle which he propelled at high and often dangerous speed through the rutted Forest tracks of those days, with net at the ready. Somehow he never fell off as far as I know!

A regular visitor to the Annual Exhibition he retained his love of butterflies to the end. Only a few hours before his death he was agreeably surprised by a colour enlargement of a valezina.

Pop was also a good field naturalist his secondary interest being ornithology. He was a likeable man with a keen sense of humour.

He is survived by his son (also an entomologist and ornithologist) and daughter, to whom we extend our sympathy.

We shall all miss him.

R.W.W. 18.11.71.

ALGERNON LEE RANSOME C.B., D.S.O., M.C., F.R.E.S.

AN APPRECIATION

In May 1969 Algernon Lee Ransome died at the age of 85. Following a distinguished military career during which he attained the rank of Major-General he retired to Braishfield where he resumed his early interest in British Lepidoptera, forming a fine collection of butterflies.

A contemporary of the late S. G. Castle-Russell and K. W. Self he collected in areas where *L. corridon* was in profusion. Many fine aberrations were taken including a number of unusual alba-caeca forms and one of the few extrema males in existence.

We first met the General in the early 1950's and during the next 17 years had many expeditions together usually after *L. corridon*. A delightful companion in the field he had considerable energy for a man of his age and could keep going through a strenuous day's collecting which was usually followed by a long drive home.

The General spent many hours examining our collection and expressed a wish in 1962 that his collection should form part of ours. A Deed of Gift was executed but of course the collection remained at Braishfield during his lifetime.

It is fitting that we also acquired the collection of the late K. W. Self so that the best aberrations taken by these two friends should remain together.

We have lost a friend who was a gentleman in the truest sense of the word.

R.W.W. 16.11.71.

6. Shoreham, larva beaten from oak, 1955, imago reared (R. G. Chatelain). Pinden, ♂ taken by E. J. Hare, October 1961 (de Worms, *Lond. Nat.*, 1964: 32).

7. Westwell (Scott, 1950).

8. Wye Downs, two, November 3, 1938, det. L. B. Prout (C. G. M. de Worms); November 6, 1954 (de Worms, *Entomologist*, 88: 62). West Studdal, scarce (E. & Y., 1949). Brook (Scott, 1950). Woolwich Wood, October 16, 1971, gen. det. (C.-H.).

11. Great Chart, larvae on maple, c. 1953, imagines reared; Hoads Wood, larvae on sloe (P. Cue).

12. Ham Street, 4 ♂♂, October 20, 1967, gen. det. D. O'Keeffe (D. O'Keeffe).

16. Folkestone, one (A. M. Morley).

VARIATION.—Siggs's Orpington specimen is strikingly aberrant, and appears to conform to ab. *intermedia* Heydem.

FIRST NOTICE, 1938: C. G. M. de Worms.

E. autumnata Borkhausen: Autumnal Moth.

Resident, perhaps native. Woods, on birch.

Note: Owing to the difficulty of checking genitally much of the recorded material, there are relatively few records of confirmed Kentish occurrence, and unless so confirmed the following should be accepted conditionally.

1. Orpington, 1949 (L. W. Siggs, in de Worms, *Lond. Nat.*, 1956: 87).

7. Westwell (Scott, 1964). Eastwell (P. Cue).

8. Dover.—Here *dilutata* is not common, "and its place seems to be taken by the more silky triangular-winged *autumnaria*" (Webb, *Ent. Rec.*, 8: 11). Brook (Scott, 1964).

10. Westerham, larva, May 8, 1937 (Coote and Jacobs, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1937-38: 37). Seal Chart (Fuller, *Entomologist*, 74: 70); I have a ♂ taken by J. L. Fuller, labelled "Seal Chart Oct./ 1941", gen. det. (C.-H.); several worn examples, October 29, 1963, gen. det.; fresh examples, October 11, 1965, gen. det.; larvae beaten from birch, May 20, 1965, from which a single example was bred, gen. det. (C.-H.).

11. Sevenoaks Weald, October 11, 1959 (E. A. Sadler). Hoads Wood (P. Cue).

12. East Kent [Ham Street] (de Worms, *Entomologist*, 72: 124). Ashford Town, two (P. Cue teste C. G. M. de Worms in litt., 15.xi.1961). Orlestone Woods, 2 ♂♂, taken October 20, 1967, by D. O'Keeffe, gen. det. D.O'K. (C.-H. coll.).

14. Sandhurst, one bred October 21, 1945, by G. V. Bull from a larva, is a fine ab., gen. det. (C.-H. coll.).

VARIATION.—The Sandhurst specimen is a large silvery white ♂ with very distinct markings.

FIRST RECORD, 1896: Webb, *Ent. Rec.*, 8: 11.

Operophtera brumata L.: Winter Moth.

Native. Woods, hedgerows, orchards, gardens, etc.; on oak, hawthorn, birch, apple, elm, cherry, dog-rose, lime, sloe, willow, hazel, maple, bilberry, aspen, sycamore, cob-nut, currant, gooseberry (fruit and foliage). In all divisions, and probably present throughout the county wherever there are deciduous trees and shrubs. "Generally far too abundant" (V.C.H., 1908).

The larva has perhaps occurred most often in Kent on the first thirteen of the above-mentioned foodplants, and there are numerous records of its having been found on these. Regarding the others, D. R. M. Long has taken the larva at Bromley on aspen, sycamore and currant; and Theobald (*Jnl. S.E. Agric. Coll. Wye*, 1910 (19), 97) records the larva at Stone-in-Oxney on cob-nut bushes, and at Rodmersham, where "they attacked the young gooseberries as well as the leaves of the bushes".

The imago is usually well out by about the third week of November, and then continues throughout December and into January. In 1862, Fenn (*Diary*) noted one at Lee as early as October 9, and I have a record that in 1939, I saw several still on the wing in East Blean on February 10—an unusually late occurrence (C.-H.). In 1952, R. Cheesman took a ♂ *brumata* which was flying in Larkey Valley Wood (div. 8) on July 6—a most extraordinary date—and showed me the specimen (C.-H.).

One suspects that *in nature* many species occasionally lie over in the pupal stage for more than one year, but to get positive evidence of this is of course extremely difficult. However, we do know of one such case with *brumata* where, though there is no actual proof of lying over, the circumstances are such as to appear fairly conclusive. In December 1945, Massee (*Rpt. E. Malling Res. Stn.*, 1946: 127) noticed that very few ♀♀ were seen in a cherry orchard at East Malling which was partially defoliated by larvae earlier in the year. He adds that in December 1946, the moths were very prevalent at this locality though the previous spring the larval attacks were negligible. Massee therefore concluded that in 1945, only some of the moths emerged in November and December, and that in that particular season many remained in pupa throughout the winter and did not produce moths until the autumn of 1946.

In the past, the species has sometimes appeared in such vast swarms in Kent as to reach pest proportions, the damage resulting being particularly noticeable in orchards. In 1909, Wakely reported that the oaks at Tunbridge Wells and Goudhurst were "despoiled of their foliage"; and on June 2 the same year, N. T. Hillier complained that at Horsmonden, "the fruit crop is doomed for this season . . . many trees having barely a leaf on them" (*teste* Theobald, *loc. cit.*). In 1907, according to Murdoch (in Theobald, *Jnl. S. E. Agric. Coll. Wye*, 1908 (17), 101), many grease bands on fruit trees at Linton contained 100 ♀♀ *brumata*; and at Rodmersham, Mercer (in Theobald, *loc. cit.*) said that "some three hundred were found on one band". So abundant, indeed, was the species in 1907, and so severe were the effects of the attacks of the larvae, that in the Sittingbourne and Faversham fruit districts, the "trees looked in summer as if it were in winter". According to Colthrup (*Ent. Rec.*, 30: 73), 1917 was another bad year for the fruit growers, larvae of *brumata* doing an immense amount of damage to apple trees that year, with large acreages in both east and west Kent practically devoid of foliage.

♂ *brumata* has been found *in cop* with ♀ *O. fagata* and *vice versa* (see under *O. fagata*).

VARIATION.—A. M. Massee told me he took eleven gynandromorphs at Old Quarry, Burbridge Cherry Orchard, East Malling, c. 1940 (C.-H.).

Newman (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1907-08: 88) recorded "black aberrations" from North Kent; and I have two ab. *hueni* Prout from West Wickham, 1947, among a lot of normal specimens from there (C.-H.).

The following are in RCK: ab. *hueni* Prout, one, Bexley, 1905, one, Herne Bay, 1933. A gynandromorph right side ♂ labelled "E. Malling Research Station. Caught on the sticky band of a fruit tree 8.xi.1943 A. M. Massee".

FIRST (PUBLISHED) RECORD, 1863: Jenner, *Week. Ent.*, **2**: 198. Though doubtless first noticed in the county long before.

O. fagata Scharfenberg: **boreata** Hübner: Northern Winter Moth.

Native. Woods, commons, heaths, orchards; on birch, apple, plum, cherry. Found in all divisions except 7, 16 (probably present in both), 15. "Common" (V.C.H., 1908).

It appears the species chiefly occurs on birch, and at West Wickham, both Wormald (*Ent. Ann.*, **1869**: 140), and Allchin (*Ent. week. Int.*, **8**: 4) record taking it on this. In orchards at East Malling, the larva is recorded as having been found on apple and plum (Massee, *Rpt. E. Malling Res. Stn.*, **1955**: 143).

The species is occasionally found in great plenty; thus, Tutt (*Ent. Rec.*, **21**: 139) recorded that on May 30, 1909, between Orpington and Chislehurst, the larvae were in "almost incredible" numbers. Fenn. (*Diary*) states that at Petts Wood on November 12, 1887, the imagines were so numerous on the birches that he could have taken 1000 ♂♂ had he so wished, but that the ♀♀ appeared very scarce.

Fenn (*Diary*) noted a ♀ *fagata* in cop., with a ♂ *O. brumata* at Petts Wood, November 12, 1887. The same observer (*Ent. Rec.*, **1**: 46) records furthermore, that he had often found ♀ *fagata* in cop. with ♂ *brumata* and *vice versa*, and added that the "progeny are not to be distinguished from *brumata*".

VARIATION.—The following abs. are in RCK: ab. *isaaki* Isaak, Bickley, Nov. 1922, W. Rait-Smith; ab. *fasciata* Peterson, one, Pauls Cray, 1889; ab. *fasciata* Peterson "on dark ground", one, West Wickham, 1887; also, an ab. with "dark ground", one, West Wickham.

FIRST RECORD, 1858: West Wickham (Stainton, *Man.*, **2**: 76).

Perizoma affinitatum Stephens: Rivulet.

Native. Woods, copses, lanesides; on *Melandrium rubrum*.

The July-August specimens may represent a partial second generation; on the other hand I have not examined any such examples, and the species is sometimes confused with *P. alchemillata* L.

1. West Wickham, worn ♀, May 14, 1860 (H. Tompkins, *Diary*, as "*alchemillaria*"). Abbey Wood (V.C.H., 1908). Bostall Heath (C. Fenn, in *Wool. Surv.*, 1909), may refer to the preceding (C.-H.). Eltham (A. H. Jones, in *Wool. Surv.*, 1909).

3. Bysing Wood, common 1913-14 and 1924-27; Wardwell Wood, common 1920-22 (H. C. Huggins). Bullockstone, two, May 26, 1922 (H. G. Gomm). Clangate Wood; Sturry, May 28 (2), June 1 (2), 2 (3), 3 (3), 1932 (W. E. Busbridge, *Diary*). Sturry district.—of regular occurrence but never plentiful in my experience in lanes at Broad Oak and in neighbouring woodlands, e.g., Den Grove, E. Blean, W. Blean, and Kemberland (C.-H.).

4. Deal*, one worn, August 3, 1891 (Fenn, *Ent. Rec.*, **2**: 204). Ickham, one, c. 1956 (D. G. Marsh).

6a. Darenth, one in Meldola coll. (Woodforde, *Entomologist*, **54**: 288). Near Upnor; Chattenden Roughs. Uncommon (Chaney, 1884-87). Chattenden, one taken by J. Ovenden, 1883, in Tutt coll. (Tutt, *Young Nat.*, **11**:

37).

7. Boxley, 1953 (A. H. Harbottle).

8. Lady Wood (Knaggs, 1870). Folkestone, 1882 (Salwey, *Entomologist*, **15**: 197). Reinden Wood, fairly common (Morley, 1931). Coombe Wood, May 29 (1), June 3 (1), 19 (1), 1895, June 6 (3), 15 (1), 1896, June 6, 1897 (1); Poulton, June 15, 1905; Kearsney, one very worn, June 10, 1932 (Stockwell, *Diary*). Haddling Wood, one, May 24, 1936 (Busbridge, *Diary*). Ewell Minnis; River; Whitfield (E. & Y., 1949). Dover, one, July 14, 1945, rather worn (B. O. C. Gardiner). Wye Downs (Scott, 1936). Brabourne, larva on *M. rubrum* (P. Cue).

11. Yalding (V.C.H., 1908). Grove Green, Maidstone, one, 1893, H. Elgar, in Maidstone Mus. (C.-H.). Wateringbury, several in E. Goodwin coll. (C.-H.); (V.C.H., 1908). Aylesford, three, 1953, two, 1954 (G. A. N. Davis)†

12. Chartham, one, June 16, 1951 (P. B. Wachter). Willesborough, in garden, c. 1953 (P. Cue); one, May 1957 (M. Singleton). West Ashford, May 12 (1), 16 (3), 17 (1 at light), 1960, May 20, 1961 (6) (M. Enfield, M. Singleton and D. Youngs). East Ashford, one in a small wood near the bypass, May 16, 1961 (D. Youngs). Hothfield Common, June 2, 1969 (de Worms, *Entomologist*, **102**: 135).

13. Tunbridge Wells (E. D. Morgan); 1956, 1957, 1958, occasional (L. R. Tesch *per* C. A. Stace).

14. Tenterden, common (Stainton, *Man.*, **2**: 80); 1960 (C. G. Orpin). Sandhurst, one, May 27, 1940, one, 1945 (G. V. Bull).

VARIATION.—Woodforde (*loc. cit.*) states that the Darenth example is referable to *ab. turbaria* St.; and Tutt (*loc. cit.*) remarked that his specimen which Ovenden took at Chattenden has "the ground colour reddish-brown".

FIRST RECORD, 1858: Stainton, *Man.*, **2**: 80.

P. alchemillata L.: Small Rivulet.

Native. Woods; on *Galeopsis tetrahit* agg.

1. Bostall Heath, one, August 4, 1865 (Fenn, *Diary*). West Wickham; Dartford* (V.C.H., 1908). Eltham, rare (A. H. Jones, in Buckell and Prout, *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1900**: 68). Chislehurst, one, July 17, 1908, one, July 9, 1924 (S. F. P. Blyth). Orpington, two, 1949 (L. W. Siggs); one, 1961 (F. A. Swain). St Mary Cray, about ten, 1957 (R. G. Chatelain). Bromley, 1961 (2), 1962 (1), 1963 (1), 1964 (3), 1965 (3), (D. R. M. Long).

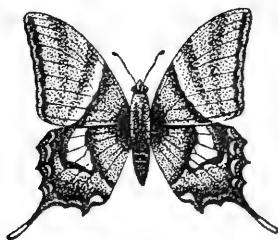
3. Thornden Wood, July 29, 1865 (Fenn, *Diary*). Little Hall Wood, one, July 5, 1944 (C.-H.). Blean Woods, one (D. G. Marsh).

4. Ickham, one, 1954 (D. G. Marsh)†. Sandwich Bay, July 24, 1967 (T. W. Harman).

5. Chevening, July 21, 28, 1914 (Gillett, *Diary*). Halstead (R. E. Frampton *per* S. Wakely). Knockholt (L. T. Ford). Westerham, fairly common, 1935, 1937, 1949 (R. C. Edwards). Andrews Wood, Shoreham, eight, July 15, 1956, several July 5, 1957 (C.-H.).

6. Greenhithe (Farn MS.). Pinden, one, 1949 (E. J. Hare). Eynsford, larvae on *G. tetrahit* agg., September 14, 1952 (Cox, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1952-53**: 87). Wrotham, one, July 20, 1965 (T. Peet).

7. Wigmore Wood (Chaney, 1884-87). Hollingbourne, larva (H. C. Huggins). Westwell (Scott, 1936); one, August 9, 1955 (C.-H.); two, 1960



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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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The Butterflies of the Isle of Wight

By T. D. FEARNEHOUGH

In 1909 Frank Morey completed his comprehensive work "A Guide to the Natural History of the Isle of Wight" in which the lepidoptera were catalogued by H. F. Poole. He made references to previously published lists: "The Victoria History of the Counties of England—Hampshire" (1900); Venable's "Isle of Wight" (1860); and Dr Martin's "Undercliff of the Isle of Wight" (1849). William Fassnidge compiled a "List of the Macrolepidoptera of Hampshire and the Isle of Wight" which was published in the Entomologist's Record (1923-1925). Since 1925 no list of the butterflies or moths has been published, although a supplement to Morey's Guide appeared in 1928 (Proc. Isle of Wight Nat. Hist Soc.).

The present paper is intended to give an account of the current position of the species of butterflies found on the Island, with some reference to variation, and some comparison with bygone times.

During the past twenty years numerous collectors have visited the Island, but in most cases such visits were made for the purpose of acquiring specimens of newly discovered lepidoptera such as *Sedina buttneri* and *Lithopane leutieri*, or of older established local species such as *Melitaea cinxia*. Thus small areas of the Island have been intensively worked, whilst other areas have received little or no attention from collectors. There may then be localities harbouring interesting species so far overlooked.

The character of the Island is steadily changing. Agricultural land is being rapidly eaten into by building developments; roads and lanes are being widened and straightened to accommodate more traffic, bigger touring coaches and heavier lorries; downland is being ploughed up for the growing of barley; and deciduous woodland is being felled and replaced in some cases by conifer plantings. Great damage has been done to insect life in recent years by the extensive use of chemical sprays. Woodlands have been sprayed to kill all undergrowth; lane verges have been treated with hormone weed killers; agricultural land has been similarly treated, sometimes by use of aircraft, and even the banks of streams have not been spared.

The detailed geology of the Island is very complex but for the purpose of the present paper the Island can be conveniently divided into three areas,

- (1) The northern part of the Island; consisting of oligocene and eocene formations, In this area there is much heavy clay soil. There are extensive woods such as Parkhurst Forest, Firestone Copse and Combley Great Wood.
- (2) The southern part of the Island; consisting largely of upper greensand, gault, lower greensand and wealdon. The soil is generally lighter than that of the northern part and the area is sparsely wooded.

- (3) The Chalk. This forms a narrow range of downs running right across the Island and separating the other two areas. In West Wight the chalk meets the sea at Tennyson Cliffs and in East Wight meets the sea at Culver Cliffs. There is a small isolated area of Chalk in the southern part of the Island, adjacent to Ventnor, forming St Boniface and Rew downs.

SATYRIDAE

Pararge aegeria Linn. (Speckled Wood)

The status of this butterfly has not changed much over the years, for Morey's statement (1908) "Common in woods and lanes" still applies. It may be seen on the wing at any time from early April to mid October during which period there are several emergences. Although specimens may be encountered almost anywhere, there are localities which the insect particularly favours. These include; Parkhurst Forest, Firestone Copse, Alverstone, Bonchurch Landslip, Bouldnor, and along the southern base of the chalk.

No variation, other than normal seasonal variation, has been recorded.

Pararge megaera Linn. (Wall Brown)

This species is widespread but does not occur anywhere in abundance. The area of its greatest strength is along the range of chalk downs, where it flies in May and again in August. An occasional specimen has been seen in October.

On the chalk, specimens having a tendency to extra spotting below the forewing eyespot have several times been noted.

Maniola jurtina Linn. (Meadow Brown)

The Meadow Brown is generally common and might be encountered anywhere on the Island. However there are areas of concentration, mostly on the lower slopes of chalk downs. Some of the wider rides in the woodlands are also favoured. In these days of intensive farming there are not many pockets of land in the agricultural areas which are left undisturbed, and where *jurtina* might build up colonies of large numbers. The normal flight period is from mid June to late August, but in one locality on the chalk, a distinct second brood occurs in late September and October. The specimens tend to be small and have other interesting features. This occurrence was the subject of papers by George Thomson (*Ent. Rec.*, **83**: 87) and R. L. H. Dennis (*Ent. Rec.*, **83**: 207).

The variation of *jurtina* on the Island is extensive and somewhat localised. On one chalk down specimens occur from year to year having whitish areas replacing the tawny colour on the forewings. In another restricted locality there is a tendency for extra spots to be present on the forewings (*ab. addenda*). Partially bleached specimens occur but are not usually associated with any particular localities. Lobb recorded

the occurrence of bleached specimens in a locality in East Wight in most seasons.

Maniola tithonus Linn. (Gatekeeper)

The butterfly is widespread but occurs in strong colonies in a number of places including Parkhurst Forest, Firestone Copse, Brading, St Boniface Down, St George's Down, High Down and Cranmore.

In his 1923 list Fassnidge gives the note; "I.W. *ab. albida* and *ab. minckii* all shades of colour from white to type." This note, contributed by E. Cornell of Ventnor possibly gives a false impression of numerous aberrations in the area. However, Cornell recorded (*Entomologist*, 53: 1920) the capture of a specimen of *ab. albida* on downs near Ventnor, 16th August 1920. Also, a fine example of *ab. minckii* was taken by J. Lobb on the same downs in 1961. Another specimen of this rare aberration was observed on St George's Down by the writer in July 1968.

A male *tithonus* captured in the Isle of Wight by L. W. Newman in 1936 was described as having pale yellowish-white ground colour. This was in the Stiff collection, and it was sold at auction in 1957 for £3.

Extra spotted specimens are rather infrequent on the Island.

Eumenis semele Linn. (Grayling)

Both the heath form and the chalk form of this butterfly occur on the Island. Unfortunately the species has declined from a former condition of local abundance to one of scarcity in recent years. Colonies of the chalk form on Brading Down, Rew Down and Arreton Down have become extinct during the last ten years. However it still occurs in West Wight. The heath form occurs on Luccombe Down, St George's Down, Bleak Down, Bouldnor Cliff and Parkhurst.

On the heathy summit of St Boniface Down an aberration has occurred from time to time having the lower spot missing on the underside of the forewing. In this locality the formerly thriving colony has been reduced to a scattering of individuals.

Melanargia galathea Linn. (Marbled White)

This species occurs in numerous places and in all three geological areas of the Island. Sometimes, where small pieces of agricultural land are left undisturbed for some years, *galathea* builds up colonies of large numbers. Such a colony, many hundreds strong, was found in the corner of a meadow at Haven Street in 1964, but two years later the inevitable happened and the plough brought about its destruction. A similar concentration occurred on a small area of ground at Cranmore in 1962, but there rapid growth of scrub ended the colony. The butterfly is plentiful on the chalk in the more sheltered spots and is also plentiful along the wider rides of Parkhurst Forest. Other localities where it is to be seen in good numbers include: Brading Down, Rew Down, High Down, St George's Down,

Luccombe Landslip, Westover Down, Railway embankment near Ashey station and Hamstead.

Variation is that normal for the species. In some colonies fresh specimens of strong yellow colour can be seen, but this colour seems to fade to cream rather quickly in the sunshine. The females vary greatly in the colour of the underside markings. I have no record of any major aberration being taken on the Island.

Aphantopus hyperantus Linn. (Ringlet)

The Ringlet is another colony-forming species, but it is also widespread in small numbers and is not attached to any particular geological area. It is plentiful in the rides of the larger woods such as Firestone Copse, Parkhurst Forest and Rowlands Wood. It was formerly common in Whitefield Wood near Ryde, but most of this wood has recently been felled. A very strong colony occupies an uncultivated meadow near St Lawrence. Here it has been closely observed for several years and the chief feature is the uniformity of the specimens, of which some hundreds have been examined.

The well known underside aberrations with diminished spotting, *ab. caeca* and *ab. arete*, are remarkably scarce on the Island, but *ab. caeca* has been captured at Rowlands Wood and at Brading. I have no records of other major varieties.

Coenonympha pamphilus Linn. (Small Heath)

This butterfly is much less plentiful than it was in former years. It declined generally through the 1960s but happily there was evidence of a slight recovery in 1970 and further recovery in 1971. It is distributed throughout all three geological areas.

There seems to be very little variation among Island specimens and I have no record of any major aberration.

NYMPHALIDAE

Melitaea cinxia Linn. (Glanville Fritillary)

When F. Poole wrote of this insect in 1909 (A Guide to the Natural History of the Isle of Wight) his tone was pessimistic. The butterfly had declined in numbers and was restricted to a few positions on the Undercliff. However, in 1923 Fassnidge could report (List of Macrolepidoptera of Hampshire and the Isle of Wight), "has increased considerably since 1909, many new localities have been formed and the old ones re-established."

The true home of this butterfly is the southern coastline of the Island where the conditions it requires arise through the rapid erosion of the coast by the sea. *Cinxia* requires an abundance of its foodplant *Plantago lanceolata* (Ribwort Plantain) scattered over an area of short vegetation. It usually chooses small stunted plants for the deposition of eggs. It is the rapid coast erosion which gives rise to slopes upon which such conditions obtain for a number of years. Further erosion

Class

destroys these areas but also produces new ones. Thus *cinxia* survives by moving from place to place along the coast as conditions dictate.

Records of *cinxia* colonies occurring away from the coast have been numerous over the years but many of them have resulted from artificial introduction. It has long been a practice of collectors interested in *cinxia* to collect large numbers of wild larvae in the hope of rearing aberrations. In some cases the surplus typical specimens reared have been released in localities where *cinxia* did not naturally occur, and sometimes colonies have formed which, after thriving for a few years, declined and died out. There was a spate of this kind of activity in the years 1950-1960. One entomologist informed me that he had released about 1000 specimens in various localities on the Island. An article by R. W. Watson (*Ent. Rec.*, **81**: 18, 1969) is also relevant.

In the period 1955-1963 colonies of *cinxia* were known at Cranmore, Cowes, Carisbrooke, Brading, Sandown, Ventnor, Steephill Cove, St Lawrence, Binnel Bay, Niton, Blackgang, Compton, Freshwater and Alum Bay. During the past four years, surveys made by the writer and A. H. Greenham have shown that of these only a few of the coastal colonies are now extant. Thus the present condition of *cinxia* is much as it was in 1909. No doubt cycles of scarcity and plenty will continue in future years.

Aberrations of the butterfly are very rare in nature, but as a result of the rearing of countless thousands of larvae by collectors of the present and last centuries many fine aberrations exist in collections. In order to gain some idea of the range of aberration, a search of the sale catalogues of some great collections has been made. A selection is given below.

<i>Collection</i>	<i>Sold</i>	<i>Description</i>	<i>Price</i>
Hope	1942	Black-banded underside	£2 4 0
Bright	1942	Female, rayed forewings	1 18 0
Bright	1942	Melanic forewings (2)	2 10 0
Stiff	1943	Almost obsolete forewings	1 10 0
Marcon	1947	Female ab. obsoleta, Ventnor 1922	1 4 0
Marcon	1947	Horizontal fulvous bands, forewings	1 15 0
Marcon	1947	Melanic forewings, 1930	2 5 0
Marcon	1947	Female albino	3 5 0
Marcon	1947	Female, figd. Frowhawk, Pl. 19	3 5 0
McLeod	1950	Female, tawny coloured underside	3 10 0
McLeod	1950	Female, melanic, 1931	1 10 0
McLeod	1950	Female, obsolete underside	0 15 0
McLeod	1950	Male, obsolete underside	1 6 0
McLeod	1950	Female, radiated underside	2 0 0
McLeod	1950	Male, radiated underside	2 2 0
McLeod	1950	Female, broad cream bands, underside	1 8 0
Burton	1962	Female, ab. suffusa, 1929	3 10 0

Woollett 1965 Male, chocolate colour, Ventnor
1935

1 0 0

Euphydras aurinia Rott. (Marsh Fritillary)

The only locality given in Morey's "Guide" in 1909 was the western outskirts of Parkhurst Forest, although single specimens had been recorded at Gurnard and near Newport. Fassnidge had nothing to add to this in 1923, but there was a record for Newtown (*Proc. I.W. Natural History and Archeological Socy.*, 1922). In 1934 Frohawk (*British Butterflies*) stated "The form from Cowes, Isle of Wight, is almost similar to the Irish race." The Cowes colony seems to have persisted for some years but no recent records are available.

A very strong colony was found by Mr J. Wright in the Cranmore area in 1947. He observed this colony for a number of years and made the following records:

1947	abundant	1953	a few seen
1948	abundant	1954	a few seen
1949	fall in numbers	1955	none seen
1950	not common	1956	several specimens
1951	very few	1957	none seen
1952	none seen	1958	none seen

Mr Wright left the area but the writer, with his direction, visited the locality every year, at the appropriate time, from 1962 to 1971, but no specimen of *aurinia* was found.

It seems probable that *aurinia* is now extinct on the Island, but there is hope that it may return or that it may still exist in some unvisited locality.

Argynnis euphrosne Linn. (Pearl-bordered Fritillary)

In the early part of the century the butterfly was widespread and occurred in almost every wood on the Island. Today it is restricted to the area north of the chalk. Here it may be seen in most wooded areas including: Parkhurst Forest, Firestone Copse, Hamstead and Bouldnor. One former locality in the northern area, Whitefield Wood near Ryde, has recently been felled.

A very beautiful melanic aberration (*ab. edna* Lobb) was captured by J. Lobb in Parkhurst Forest, 19 May 1952. It is now in the National Collection. (*Ent. Rec.*, **65**: 56, Plate 3).

Argynnis selene Linn. (Small Pearl-bordered Fritillary)

Less common than *euphrosyne*, this species also is restricted to the northern area. It occurs in Parkhurst Forest, but its area of greatest strength lies between Newtown and Yarmouth. In recent years the numbers have become greatly reduced due to the foodplant being smothered by growth of coarse grass and scrub, and also much of its ground has been planted with conifers.

I have no record of any aberration.

Argynnis aglaia Linn. (Dark Green Fritillary)

In the 1909 list this species was given as "local but not particularly common", the localities mentioned being; Freshwater, The Undercliff, Parkhurst, Haven Street, Ventnor, Luccombe and St. Boniface Down, but in 1923 Fassnidge has the note "very common on downs".

From 1945 to about 1960 *aglaia* had strong colonies on Brading Down and St. Boniface Down but both colonies declined rapidly after the latter year. No *aglaia* has been recorded on Brading Down since 1962, and very few have been seen on St. Boniface Down. A single specimen was seen on Rew Down in 1970. This decline is simply explained by the present scarcity of foodplant (Dog Violet) which used to be so abundant prior to 1960.

The butterfly has been recorded from Cranmore by J. Wright in 1947 and it still occurs in numbers on the downs of West Wight.

I have no records of aberrations.

Argynnis cydippe Linn. (High Brown Fritillary)

This species has always been a rarity on the Island. It may still occur in Parkhurst Forest but there are no recent records. It occurred sparingly at Hamstead in 1955 (J. Wright) and was recorded in West Wight in 1947 (Dr K. Blair).

Argynnis paphia Linn. (Silver-washed Fritillary)

It is found only in the woods of the northern area of the Island, the localities being; Rowlands Wood, Whippingham, Firestone Copse, Parkhurst Forest, Newtown and Hamstead. The butterfly appeared to be increasing in numbers from 1962 to 1969 but then declined rapidly to 1971.

Var *valezina* has occurred frequently. In one locality in 1969 about half the total number of females were of this form.

Vanessa cardui Linn. (Painted Lady)

This migrant species is seen almost every year in greater or lesser numbers. It is sometimes recorded in the Spring as in 1966 when the writer saw five on Brading Down, 25th May, and 24 in the same locality 27th May. A large influx of *cardui* was recorded by J. Wright during late February and March in 1952. Both 1970 and 1971 were poor years for *cardui*, only widely scattered individual specimens being seen.

Vanessa atalanta Linn. (Red Admiral)

Another migrant which occurs every year in varied numbers. The first specimens are usually seen in late May or early June. From the end of August and through the Autumn into November the butterfly comes to notice by its addiction to various flowers, especially Buddleia, Michaelmas Daisies, *Sedum spectabilis*, Dahlias and finally on overripe fruit of various kinds.

Nymphalis polychloros Linn. (Large Tortoiseshell)

Until recent years the Island was a stronghold of this rare butterfly. Morey's "Guide" gave the localities; Parkhurst, Ventnor, Sandown, Brading, Shanklin and the Undercliff.

The species was recorded at Ventnor in 1921 by E. Cornell. More recently it was noted in West Wight by Dr K. Blair in 1947, 1948, 1949 and 1950. Mr J. Wright has the following records for the Cranmore district; 14th August 1946, 5th May, 1947, 1st July 1947, and 29th February 1948. He also found a large batch of larvae on Wych Elm at Cranmore on 12th June 1947, and a small batch of larvae at Ningwood on 16th May 1948. Six specimens were recorded by Harris at Bembridge in August 1946. A specimen was seen in Parkhurst Forest by J. Lobb, 26th June 1955.

The last record is of two specimens at Quarr in 1962.

Nymphalis io Linn. (Peacock)

This species may be encountered anywhere but has years of scarcity and years of plenty. Hibernated specimens are usually frequent along the southern coastline in Spring, but some of these may be migrants.

Aglais urticae Linn. (Small Tortoiseshell)

The butterfly is plentiful in most years and is double brooded, so there are three main flights; hibernated specimens in the spring months; first brood in July; second brood through the Autumn. The flowering plant most attractive to this species is *Sedum spectabilis*, flowering in late August and early September.

In some years specimens of ab. *polaris* of greater or lesser degree are not uncommon.

Polygonia c-album Linn. (Comma)

Although never locally common the butterfly occurs throughout the Island. It is double brooded, appearing on the wing in July and again in the Autumn. The hibernated spring-flying specimens are not so evident. Second brood butterflies are attracted into gardens by Michaelmas daisies and *Sedum* in September, and by over-ripe fruit in October. Away from gardens the butterfly is fond of over-ripe blackberries in the hedgerows.

This species is one of the few which have an improved position compared with that in the early part of the century, when it was a very scarce insect.

Some of the July flying specimens are referable to *var hutchinsoni* Robson.

(to be continued)

Inverness-shire in 1971

By Commander G. W. HARPER, R. N. Retd., F.R.E.S.

The winter of 1970-71 was again an open one with few extremes of low temperatures or depth of snow. A mild Christmas was followed by a cold frosty Hogmanay and New Year, but the rest of January was very dry and mild, so that *Phigalia pedaria* Fab. appeared on my local wooden posts on 17th, about the usual date. The emergence continued into February, when some sharp frosts and snow stopped the appearance of immigrant birds as well as hibernating Lepidoptera.

In March, the first *Calostigia multistrigaria* Haw. emerged in my Spinney, flying with hibernating *Conistra vaccinii* L. on mild evenings; immigrant plovers and oystercatchers however were delayed until late in the month by which time the *Orthosias* and *Achlyia flavicornis* L. were coming to m.v. light. The last day of the month a fresh *Panolis flammea* Schf. (*piniperda* Panz.) appeared in my m.v. light trap.

April came in quietly and continued a pleasant month, with the emergence of the Spring Lepidoptera only a few days late, and in quite good numbers. Mr B. Goater found the first *Brachyonica nubeculosa* Esp. on a Kincaig Birch, on 2nd and I was pleased to find that the Laggan colony of *Poecilopsis lapponaria* Bdv. was out in small numbers on 7th, having survived the mutilation of its habitat by the Forestry Commision. The middle of the month including Easter was fine and sunny, the sun-loving *Aglaia urticae* L. and *Brephos parthenias* L. taking advantage of it. A few male *Endromis versicolora* L. were reported seen on Granish Moor. Mr Wheeler had a surplus of F2 generation pupae of Aviemore stock of this species, which I released for him in various localities in the area; no assembling was however noted: though 28 ♀♀, 22 ♂♂ were so released during the month. The season was by now earlier than usual, and the birches were shewing green by the end of the month.

Beautiful Spring weather continued in May, and on 3rd *Odontesia carmelita* Esp. appeared in my m.v. light trap, a little early; at Nairn on 4th in brilliant sunshine on the Moray Firth coast I found *Pieris napi* L. and *Anthocaris cardamines* L. well out and flying together in numbers; this is the earliest date I have ever seen the latter in Scotland, while on the same day a few larvae of *Amathes xanthographa* Schf. found feeding on coastal grasses were well grown in last instar. A fresh *Orthosia gracilis* Schf. joined the small company in my m.v. trap at Newtonmore that night. By 12th May, female *A. cardamines* L. were busy ovipositing on *C. pratensis* (Lady's Smock) near Kingussie and *P. napi* also was flying widely by this early date here. Butterflies continued to emerge with *Brenthis euphrosyne* L. flying at Newtonmore on 21st May; wind was however Easterly with cold and frosty

nights in the last week of the month resulting in very meagre trap catches, no less than four nights being nil! I understand that these very poor results also obtained in Southern districts in England.

June came in with warm sunny days and butterflies continued to emerge well; on 1st my local colony of *Cupido minimus* Fues. near Aviemore was emerging well, as also was *Erynnis tages* L. As I have been feeling anxious about the state of *Carterocephalus palaemon* Pall. I visited some of its stations west of the Great Glen on 3rd June. I am glad to be able to report that, although reduced in numbers by the rapid growth of the Forestry Commission's plantations this lovely and rare little butterfly has survived in several spots. *B. selene* Schf. was well out and flying in this area also. Back in Badenoch *B. euphrosyne* L. was fully out in good numbers, and I was very pleased to see again one or two Spring brood *Lycaena phlaeas* L. Cold North-East winds still prevailed, so that the appearance of the Summer moths continued as a thin trickle. Trap catches were further decimated by a great increase in the number of long-eared bats hawking low over the trap, and frequently entering it leaving nothing but some wings. This species seems to be the severest moth predator of all now in this area. Sharp frost on 10th and bitter Easterly gale on 11th. The English warmth did not reach us until the end of the month.

July started with warm and thundery conditions, the usual Summer species flying in fair numbers, but Immigrants were scarce again this year, the only *Plusia gamma* L. of the year coming to light on 4th. But 28th was a very interesting night, in which Mr Bretherton trapped at Kinraig a specimen of *Plusia iota*, L., a male in fair condition, and probably a rare vagrant. I have never seen this species in the Highlands before, where it is rare and sporadic in appearance. Between these dates the weather was cold, wet and stormy with northerly winds and my trap continued to be plagued by long-eared bats on several nights! A few warm days and nights interspersed with the cold gales showed the common Summer species to be as usual.

August weather was rather mixed, with heavy rainfall early in the month, unhappily at the same time illness severely limited my entomological activities and necessarily also my observations. This was particularly galling and during a wonderful spell of hot "Indian summer" weather early in September, continuing fine and calm until mid-October when sharp frost, snow on the hills, and delayed equinoctial gales virtually closed a pleasant but unlucky season for me, with little of interest to report.

Nedaich, Newtonmore, Invernessshire 10.1.72

Butterflies in Yugoslavia, 1971

By A. G. IRWIN, F.R.E.S.

From July 10 to September 4, during the summer of 1971, an expedition from the Department of Zoology, University of Southampton, was in the Neretva Valley, Yugoslavia. Most of the work was ornithological in nature, but some time was spent collecting butterflies. To save time, both in Yugoslavia, and in England, the butterflies were identified as soon as captured, using Higgins and Riley's "Field Guide to the Butterflies of Britain and Europe." Specimens which showed interesting variation, or which proved very difficult to identify, were killed and kept in papers.

This method of identifying butterflies is, of course, subject to mistakes, but any specimen which proved difficult was kept until satisfactorily identified. The method (which was impracticable until the appearance of the field guide) is, however, very rewarding from two points of view. The first is that, once identified, the specimen may be released, thus dispelling any worries about the possibly precarious status of a local population. Secondly, much more can be learnt about the flight and other behaviour of a particular species. Field identification of flying or settled insects therefore becomes easier and more accurate. The collector, who recognises his butterflies from purely morphological points, must surely be at a disadvantage if he should just miss an odd-looking specimen.

The Neretva River flows from the mountains, just south of Sarajevo, to the Adriatic Sea, near Metković. Most of the rock of the surrounding country is limestone, but, in many places, silt has filled in basins to form large areas of fertile land which are intensively farmed. The mountain slopes are covered with mixed woods or scrub, and the coastal vegetation consists mainly of Mediterranean scrub, although large tracts of marshland occur. The weather during the expedition was mostly very hot and dry, with a few thunderstorms and torrential downpours.

The area was very rich in insect life, including butterflies, but also very rich in birds. The time spent collecting butterflies was therefore rather limited, and, accordingly, the species list does not do justice to the wealth of the Lepidopteran fauna.

The following list gives details of localities mentioned in the species list.

Heights are in meters.

Near Aleksin Han. Steep wooded hillside. 500m.

Boračko Jezero. Lake surrounded by steep wooded hills 500m.

Borci. Alpine meadows and woods. 800m.

Deransko Jezero. Marshy lake surrounded by scrub-covered and wooded hillsides, 20m.

Hutovo Blato. Marsh with wet woodland and scrub-covered hills. 4m.

Kuti Jezero. Scrub-covered and wooded hillsides (coastal). 140m.

Metković. Wet woodland and scrub-covered hills. 4m.

Moštrasko Blato. Cultivated valley. 200m.

Ostrazac. Wooded and cultivated hillsides. 250m.

Zeljusa. Arid scrubland. 100m.

Species of Butterflies recorded in the Neretva Valley, Yugoslavia, from July 10 to August 30, at heights from Sea-levels (S.L.) to 800m.

Species for which there are very few records have full details. Other species have the altitude range and dates shown, together with an indication of frequency within the altitude range.

An asterisk marks those species of which specimens were taken.

Papilio machaon L. SL — 200m. July 11-Aug. 30. Widespread.

Iphiclidides podalirius L. SL — 800m. July 11-Aug. 27. Widespread.

Pieris brassicae L. SL — 800m. July 16-Aug. 30. Widespread.

**Pieris rapae* L. SL — 500m. July 10-Aug. 30. Widespread

Pieris ergane Geyer. Zeljusa, July 18 and Kuti Jezero, Aug. 2.

Pontia daplidice L. SL — 100m. July 16-Aug. 28. Local.

Euchloe ausonia Hüb. Zeljusa, July 11 and Hutovo Blato, July 16.

**Colias crocea* Geoff. SL — 800m. July 11-Aug. 30. Widespread.

**Colias australis* Verity. Borci, July 23.

Gonepteryx rhamni L. 20m-800m. July 10-Aug. 30. Widespread

Leptidea sinapis L. SL — 800m. July 22-Aug. 28. Widespread.

Libythea celtis Laicharting. Boračko Jezero, July 9 and Deransko Jezero Aug. 30.

Apatura ilia Schiff. Hutovo Blato, July 16.

Limentis reducta Staudinger. SL — 500m. July 14-Aug. 28. Widespread.

Neptis rivularis Scop. Near Aleksin Han, Aug. 6. (A late time for this butterfly).

Nymphalis antiopa L. Boračko Jezero, July 9 and 27. Moštar-sko Blato July 12

Inachis io L. 100m-800m. July 10-Aug. 8. Widespread.

Vanessa atlanta L. SL — 500m. July 25-Aug. 30. Widespread.

Vanessa cardui L. SL — 800m. July 22-Aug. 30. Widespread.

Polygonia egea Cramer. SL — 150m. July 14-Aug. 30. Local.

Argynnis paphia L. 50m-800m. July 10-Aug. 21. Widespread.

Mesoacidalia aglaja L. 250m-800m. July 24-Aug. 21. Widespread.

Fabriciana adippe Schiff. 100m.-800m. July 22-Aug. 28. Local.

Melitaea didyma Esp. 20m-100m. Local.

Mellicta athalia Rott. Near Aleksin Han, July 10 and Zeljusa, July 31.

Melanargia galathea L. 100m.-500m. July 18-Aug. 8. Local

Hipparchia fagi Scop./*H. alcyone* Schiff. SL — 800m. July 18-Aug. 30. Widespread.

**Hipparchia fagi* Scop. Borci, July 24. (Jullien Organ:-5 rods on each side).

**Hipparchia statilinus* Hufnagel. Metković, Aug. 28.

Chazara briseis L. SL — 800m. July 14-Aug. 27. Widespread.
(to be concluded)

The Distribution of Insects related to Railway Embankments

L. MCLEOD, B.Sc. F.R.E.S.

(25 Sleford Close, Balsham, Cambridgeshire)

The recent request by the Croydon Natural History Society for old insect records from northern Surrey stimulated me to refer to my earliest entomological notes, which were made during my early "teens". While referring to these notes my mind was full of memories of school days and of "prize" insect specimens taken in a suburban garden.

During my childhood and until I left home in 1962, I lived in a house in Streatham, South London. The garden was always full of flowers and fruit trees of several kinds. Insects were also plentiful and I began recording them in 1950 when my entomological interest began to show itself.

Our garden backed onto the main London—Brighton Railway Line and even then I realised that many of the insects were attracted to our flowers from the grassy railway embankment at the far end of our garden. Nearby gardens, similar to our own but which did not back onto an embankment, possessed far fewer insect species.

It was in the early fifties that I witnessed the arrival and increase in population of the syrphid fly *Volucella zonaria* Poda. There were many present in the summer months, also *V. pellucens* L. and *V. inanis* L. At this time I was not aware that *V. zonaria* had previously been uncommon in England.

In recent years more insect species have been recorded in this garden by my brother A. R. McLeod. Even the number of butterfly species has increased. In 1970, the Speckled Wood *Pararge aegeria* L. and the Small Heath *Coenonympha pamphilus* L. were recorded for the first time. Both of these species occur in colonies some miles distant and are separated from Streatham by uninterrupted built-up areas.

This increase in butterfly species is perhaps connected with a change in the maintenance methods employed by British Railways. Until the early sixties, steam locomotives were still in use and it was usual for the grass to be cut during the summer months and, after drying for a few days, it was burnt under supervision. This process was a reasonable method of preventing accidental fires on the embankment. Fires were, however, frequently caused by hot coals, despite the cutting and burning.

With the advent of diesel locomotives, the frequency of fires on the embankments has been greatly reduced and the supervised cutting and burning of the grass has been delayed until early autumn and sometimes completely abandoned.

The results of this change is the survival, throughout the summer months, of many miles of wild grasses and flowers which can provide refuge, feeding and perhaps even breeding sites for some butterflies (Watson 1969). On the embankment opposite our garden occur Umbellifers, Daisies, Buttercups, Plantains, Vetches and many Crucifers, as well as occasional clumps of nettles and thistles.

Railway embankments with their assortment of wild flowers and grasses are possibly of great importance in the passage of insects from one suitable habitat to another. Agricultural land with its lack of "natural" plants can be as much a barrier to insect dispersal as are built-up areas, especially when hedgerows are treated with herbicides or completely removed.

In recent years, the abandoning by British Railways of many uneconomical lines has resulted in some embankments and tracks reverting to a completely wild state. The use of these as nature trails and of the dramatic increases of insect populations in these areas has been reported in several papers. (eg. Whitehouse 1966).

It is hoped that more local Naturalist Trusts will take advantage of the availability of these disused railways by making them into nature trails for educational purposes and thereby help insect conservation in this country.

The following butterflies were recorded in Streatham, London, S.W. 16. during May — August 1970.

Green Veined White	<i>Pieris napi</i> L.
Small White	<i>P. rapae</i> L.
Large White	<i>P. brassicae</i> L.
Orange Tip	<i>Anthocaris cardamines</i> L.
Speckled Wood	<i>Pararge aegeria</i> L.
Wall Brown	<i>Lassiomata megera</i> L.
Meadow Brown	<i>Maniola jurtina</i> L.
Small Heath	<i>Coenonympha pamphilus</i> L.
Common Blue	<i>Polyommatus icarus</i> Rott.
Small Copper	<i>Lycaena phlaeas</i> L.
Comma	<i>Polygonia c-album</i> L.
Small Tortoiseshell	<i>Aglais urticae</i> L.
Painted Lady	<i>Vanessa cardui</i> L.
Red Admiral	<i>V. atalanta</i> L.
Large Skipper	<i>Ochlodes venatus</i> Brem. & Grey
Small Skipper	<i>Thymelicus sylvestris</i> Poda

It may perhaps be worth recording that the Grizzled Skipper *Pyrgus malvae* L. and the Dingy Skipper *Erynnis tages* L. were once common in this area.

After the war and until the early fifties these two Hesperiiids were common on the London/Surrey border on the

site which is now Norbury Park. Much of this site was divided into allotments during and shortly after the war. These were gradually abandoned and wild grasses and flowers grew waist high in places. Both *O. venatus* and *T. sylvestris* were common, but since the site was levelled and converted to a park, I have not recorded these species in the area.

I consider that the above list of butterfly species is quite remarkable for a south London suburban garden. *Gonopteryx rhamni* L. can also be seen in some years. The number of species listed is undoubtedly related to the presence of the railway embankment.

Railways constitute a huge network throughout the country passing through natural habitats, agricultural land, towns and cities. The railway embankments with their wild plant species can assist insect dispersal by providing passage ways through otherwise "sterile" areas. With an ever increasing human population, our towns, cities and roads spread alarmingly. The importance of railway embankments to our insect life might well be increased. Let us hope that the practice of burning and use of herbicides on railway embankments is kept to a minimum.

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 Whithouse, S. J. 1966. New Habitats *Bull. Amat. Ent Soc.* **25**: p. 41

New Forest Mercury Vapour Light Records for 1971

By L. W. SIGGS

During 1971, numbers were low in the trap at Minstead, especially in June (a very wet month) and October. Nights were generally cold; the minimum temperature at night never exceeded 16°C (9th July) when the catch was 461 specimens in 90 species.

	Nights	Specimens Total	Average	Species Average
March	23	1423	62	8
April	28	3090	110	10
May	31	1033	33	14
June	30	2285	76	27
July	31	5623	181	53
August	26	5251	202	40
September	29	2339	81	17
October	29	1416	49	13
November	17	351	21	6

The number of species first recorded for the year in each month was — February, 7; March, 16; April, 20; May, 73; June, 81; July, 91; August, 35; September, 19; October, 9; November, 5. The total of species recorded was 356. This is about average.

There were again four additions to the Minstead list:—

Cucullia verbasci L.

Lygris prunata L.

Chesias rufata F.

Eupethecia tenuiata Hübn. (when this was previously reported it was confused with *E. plumbeolata* Haw. but the 1971 specimens have been verified).

The following captures of species which are not common here are worthy of note:—

Euxoa nigricans L.; *Graphiphora augar* F. (2); *Orthosia advena* Schiff.; *Eremobia ochroleuca* Schiff. (2) — the third successive year this unexpected visitor has turned up; *Proculus versicolor* Borkh. (2) — first recorded 1970; *Moma alpium* Osbeck; *Lithophane leautieri* Boisd. (6) — the local colony continues to prosper in its third year; *Xylena vetusta* Hübn.; *Scopula imitaria* Hübn.; *Operophtera fagata* Scharf.; *Chloroclystis debiliata* Hübn.; *Ligdia adustata* Schiff. *Gnophos obscurata* Schiff.; *Itame wauaria* L. (3) for the second successive year.

A scarcity worth recording is of *Diarsia brunnea* F. Only one was taken whereas the usual annual catch is from 30 to 100.

MIGRANTS. An even poorer year than 1970.

Lithosia quadra L. (4); *Agrotis ipsilon* (28); *Peridroma porphyrea* Schiff. (4); *Plusia gamma* L. (488); *Nomophila noctuella* Schiff. (119); *Plutella maculipennis* Curt. (1). (The only consolation was the sight of a *Macroglossum stellatarum* L. hovering and feeding at *Aubretia* on the rockery on 9th May, the first time I have ever seen it here).

POLYMORPHISM

Biston betularia L.

typical 25 (78%)

carbonaria 6 (19%)

insularia 1 (3%)

Sterrhya aversata L.

remutata 134 (72%)

aversata 52 (28%)

I append a comparative table of percentages for these two species over the past few years for which figures are available:—

Biston betularia L.

	1960	1961	1962	1963	1964	1965	1966	1967	1968
typical	93.3	86.8	91.1	85.3	87.6	89.4	89	84	91
carbonaria	nil	13.2	6.7	4.8	4.4	4.5	7	5	1
insularia	6.7	nil	2.2	9.9	8.0	6.1	4	11	8
	1969	1970	1971						
typical	83	88	78						
carbonaria	8	9	19						
insularia	9	3	3						



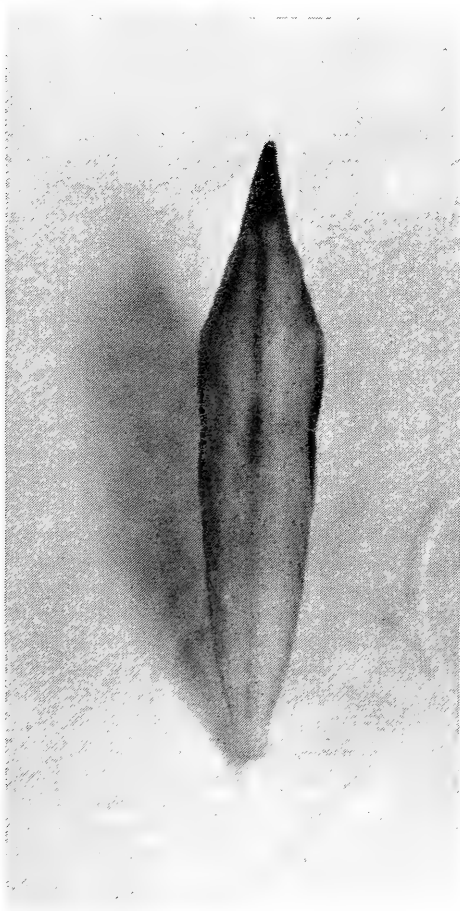
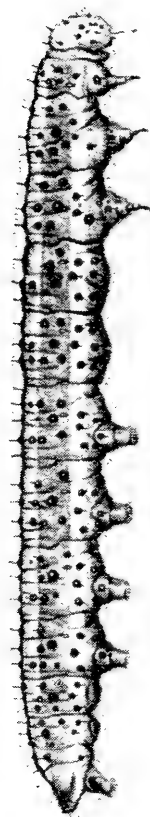
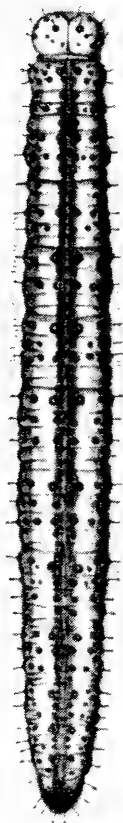


PLATE IV

Euchloe ausonia Hübner

above — larva, dorsal and lateral views.

below — pupa, dorsal and lateral views.

enlarged roughly $\times 3$

Sterrrha aversata L.

	1963	1964	1965	1966	1967	1968	1969	1970	1971
<i>remutata</i>	78·3	75	68·1	75	71	95	67	75	72
<i>aversata</i>	21·7	25	31·9	25	29	5	33	25	28

Eilema deplana Esp. 3 (all *unicolor*)*E. griseola* Hübn. 6 (Typical 5, *flava* 1)*Apamea crenata* Hufn. 1 (*alopecurus*)*Cucullia chamomillae* Schiff. 2 (both *chrysanthemi*)*Chloroclysta siterata* Hufn. 64 (Typical 59, *fasciata* 5)*Hydriomena furcata* Thunb. 24 (Typical 23, *obscura* 1)*Alcis repandata* L. 65 (Typical 60, *conversaria* 5)

Sungate, Football Green, Minstead, Lyndhurst, Hants.

The Larva and Pupa of *Euchloe ausonia* Hubner from Greece (Lep. : Pieridae)

By JOHN G. COUTSIS, B.A., M.ARCH

The full grown larva of *Euchloe ausonia* has a length of approximately 1¼ inches and is slightly stouter than that of *Anthocharis cardamines* L. The head is yellow-green and has a number of small shiny black warts, each with a short black bristle. The body has a mid-dorsal dark blue-grey or violet-grey stripe with the dorsal artery showing through in a lighter shade; this is followed by a yellow sub-dorsal stripe; beyond this there are two lateral stripes, the first relatively wide and light blue-grey or green-grey and the second narrower and yellow.

Ventral area green; pro-legs and true legs green. The whole body and head covered with short whitish hairs; sides and dorsum with prominent, shiny, black warts each with a single black bristle. Spiracles brown. The dorsum of the last abdominal segment with a darkened area reminiscent of a saddle.

The pupa has a length of about 1 inch. At first it has an overall purplish tinge, but this is gradually lost and the pupa then becomes sand coloured with fine light brown speckling. Body with a faint and narrow sub-spiracular light sand coloured stripe extending the length of the abdomen, and another sub-dorsal one, of the same colour, extending over the abdomen and thorax, and reaching the base of the head. A faint mid-dorsal grey-brown stripe extends from the head to the tip of the abdomen, but is most obvious along the first half of its length.

The head prominence, shoulders and leg cases, finely speckled with dark grey-brown. Wing cases light grey, venation light sandy.

Inner margin of wing cases with a well defined dark brown streak. Spiracles light brown. A few black dots interspersed over most of the body surface. The head prominence is bent downwards. Wing cases not particularly bulgy. Body stouter than that of *cardamines*.

In captivity the larvae were fed on *Isatis* species.

Denis & Schiffermüller : A Correction

My note (Vol. 83, pp. 266-268) on the 1775 *Ankündigung* was anticipated by a year in a most interesting and important paper by Dr Klaus Sattler (1970, Das "Wiener Verzeichniss" von 1775. *Zeits. wien. ent. Ges.* 54 (80) (1969): 2-7, pls. 1-3).

He found that the Linnean Society copy was sent to Linnaeus by Schiffermüller himself, with a covering letter dated 11th September 1775 which mentioned the co-operation of Denis. Its arrival in this way no doubt explains how it came about that the work was catalogued under Schiffermüller's name alone. Dr. Sattler also reproduces the *Ankündigung* title page and shows that the accepted title, which I repeated, is wrong in at least four places. It should read:—

Ankündigung eines systematischen Werkes von den
Schmetterlingen der Wienergegend

An earlier paper of great interest draws attention to a collection of paintings now in the British Museum (Natural History), and traces its history (Higgins, L. G., 1959. The original larval figures of Schiffermüller. *Entomologist*, 92: 49-60). Dr. Higgins shows that there were 54 plates towards the planned continuation of the "Wiener Verzeichniss", and that after that project was abandoned they were passed to Jacob Hübner, who used them in his *Geschichte europäischer Schmetterlinge*. Hübner later mentioned both Denis and Schiffermüller, and their *Ankündigung*, on page 6 of his *Lepidopterologische Zuträge*.

The opportunity is taken to remark that the *Field Guide to the Butterflies and Burnets of Spain* by Manley & Allcard (see vol. 83, p. 118) is one recent work which does restore to Denis his proper place as co-author.

C. F. COWAN.

How I Started Collecting

By R. TOMLINSON

From the late thirties until just before he died, my father was the steward of a local firm's sports club near where we lived at Uplands Estate near Purfleet in Essex.

In the late forties my mother and I used to go to the club when the members and their guests had all gone home, and help dad to clear up. He found it difficult to get around much, could not do any bending or stooping because he was disabled, having lost a leg in the battle of the Somme in the 1914-18 war.

This club was somewhat apart from the rest of the estate and not far from a wood, known locally as the "First Woods" or "May's Woods". As one might guess, quite a crowd of moths were attracted to the lights of the club and I became interested as to their identity. It was not long before I bought the 1948 edition of the two volumes of "South", and managed to despatch my captured specimens by means of a jam jar and some

cottonwool in it moistened with some commercial cleaning fluid known, as I believe as "Thawpit", or something similar; I did not keep a diary then. I used to set the insects up roughly with "lill" pins, but did not keep my captures, throwing them away once I had found out what they were. Shame upon me, you might well say, but that is how it was those days. I can remember Cream-Spot Tigers and Garden Tigers, but the one which pleased me most was the Least Carpet, because South made no mention of it being found in Essex, but stated that in order to obtain the species, a journey would have to be made to one or other of its special haunts in Kent, lying between Greenhithe and Sheerness.

I had no friends in those days with natural history interests, and did not know of the existence of natural history societies, much less the existence of entomological societies, so my findings, valuable though they might have been, found no outlet to the outside world.

A lot of water passed under the bridge, as the saying goes; my father died in late 1956, my mother married again, and we moved to my present address in 1958, and by then I had found new interests, bird watching among them. It came to pass that I received a letter in early 1965 from that doyen of Essex bird watchers, Mr H. R. Tutt, asking me to meet a certain Mr Roger Smith, and show him round my area of East Tilbury. I duly met him and we went birding on several occasions, and one of the areas visited was "Golden Gates" at Mucking. He was very impressed by the place and said "I'll bet this is first class for moths", and went on to say he had some sugar mixture made up that was two and a half years old and should be really good by now for attracting moths. To cut a long story short, we did four sugaring excursions to "The Golden Gates", and I can honestly say these were the most satisfying and exciting moth collecting expeditions I have even taken part in. On every occasion moths were elbowing one another off the sugar, and it was he who took me to his home and showed me the rudiments of setting up. He also introduced me to Don Down and to the legendary Mr Huggins, and lent me several different entomological magazines, *The Record* amongst them. It was not long before I bought a Honda generator from a local dealer and the rest of the gear from Watkins and Doncaster, so that I too could collect lepidoptera. You see, all those years the spark was still there, and it only needed someone like Roger to swiftly fan it into flame. Since then, I have concentrated more on lepidoptera collecting, whilst Roger has turned more to bird watching, and has travelled Europe in fact in order to expand his "life list"; although I still take an interest in birds and he still takes an interest in lepidoptera; we seem to have swapped interests, so to speak. Not a bad exchange. Even though his work has taken him to Dumfriesshire, I still correspond with him and we exchange our respective news.

With regard to *The Record*, I can already hear the grumbles

about the increase in subscription, but I still think it is the finest entomological magazine in the country; what other editor would try to decipher my biro pen scrawl and turn it into an acceptable article? Not many, I think. With *The Record* and the latest "Field Guide to the Butterflies of Britain and Europe" I can peruse articles on European collecting by Mr J. A. C. Greenwood, Mr R. F. Bretherton, the Baron de Worms and others, and live again the joys of their discoveries.

51 King Street, Stanford-le-Hope, Essex.

Notes and Observations

INTERSPECIFIC COMPETITION IN BUTTERFLIES. — In his paper "Observations on British Butterflies, 1970" (1971 *Ent Record* **83**: 259-266) Dr Luckens writes with reference to a wood previously noted for the occurrence of *Argynnis cydippe* L. "All the subsequent captures in the wood have proved to be *A. aglaia* L. and I wonder if it has recently colonized the wood and displaced the very similar *A. cydippe* by natural competition."

Exactly what sort of natural competition does Dr Luckens visualise? It can hardly be competition for the food-plant; neither species is numerous enough to exhaust supplies of dog violet in a wood. Does he suggest that whenever an *aglaia* meets a *cydippe* it attacks and drives it away? Surely a more likely explanation is some subtle change in the ecological structure of the wood, which now renders it more suitable for *aglaia* and less so for *cydippe*.

Here in East Africa, we do have real cases of food-plant competition. The larvae of the Saturniid *Citrina forda* Westw. live gregariously and often defoliate the food-plant, a small tree *Sideroxylon diospyroides* (Sapotaceae), completely starving not only themselves, but all other larvae feeding on the same tree, which include *Pseudoacraea lucretia* Cr. (Nymphalidae), *Dasychira proleprota* Hamps., *cratista* Collnt. (Lymntriidae) and several species of *Eutelia* (Noctuidae). Presumably the same thing happens in England with *Tortrix viridana* L. and other oak-feeding larvae. On the other hand the Nymphalids *Euxnthe tiberius* Gr. Sm. *E. wakefieldi* Ward and *Charaxes violetta* Gr. Sm. all feed on the same food-plant (*Deinbollia* spp. (Sapotaceae)) and all three coexist in the same small patch of forest, although the imagines of *tiberius* prefer a more shaded habitat than the other two. — D. G. SEVASTOPULO F.R.E.S., Mombassa. 27.xii.1971.

STIGMELLA OXYACANTHELLA STT. (LEP NEPTICULIDAE): In his "Notes on some of the British Nepticulidae" (antea. 169), Lieut. Col. Emmet states that there is some disagreement as to

whether this species is univoltine or bivoltine.

After having twice reared this species, the first time accidentally, it is my opinion that *oxyacanthella* is bivoltine. During the early summer of 1965 I was rearing a batch of hawthorn-feeding noctuid larvae which went down to pupate during July. About mid-August, two imagines of *oxyacanthella* appeared at the top of the container, the absence of a fascia from the forewings being the basis for the identification. Unfortunately, after a thorough search through the debris left by the Noctuid larvae, I failed to find either the mines or the empty cocoons, and I assumed that the former had been consumed by the Noctuids.

On 11th October 1970 at Luxulyan, Cornwall, I gathered a hawthorn leaf which contained two mines, each of which was occupied, duly resulting in two pinkish brown cocoons a few days later. One of the cocoons eventually produced a parasite, but the other, after overwintering, produced a moth in June 1971. From this, it would appear that at least in Cornwall the species is bivoltine, and that L. T. Ford's time-table (no. 1286) in his Guide to the smaller British Lepidoptera, is correct, i.e., that moths emerge in May/June and again in August.—J. L. GREGORY, 17 Grove Rd., St Austell, Cornwall. 30.x.1971.

EARLY STAGES OF *BRAHMAEA JAPONICA* (LEP. SATURNIIDAE):
Livestock is not difficult to obtain from some of the British entomological dealers and the larvae are easy to rear on a diet of *Ligustrum* (privet), the green-leaved varieties being best. The following notes are made from ova received in March 1970.

Ovum. Smoky brown, smooth, about three quarters of a sphere with a flat base; microphyle dark and conspicuous; a series of concentric indistinct reddish brown circles, centred about half-way up the side. Empty shell pale brown.

Larva: 1st Instar: Head shining black, rings 1, 2, 3, 11 and 12, yellowish orange with black dots, two very long hairy horns on rings 2, 3 and 12; a single central horn on ring 11. All horns pale yellowish brown at first, becoming black. Rings 4 to 10 pale grey with black bands; underside and prolegs black. Whole body adorned with small tufts of short hairs. 2nd instar: horns shining black without hairs. Spiracular line yellowish orange, body devoid of hairs or bristles. 3rd instar: Horns on ring 12 reduced in size and black bands on body now broken up into dots. 4th instar: Body uniformly whitish grey with black dots along and just above spiracular line. All horns except on ring 12 still long and slender with a tendency to curve at the tip. Head now mainly black with vertical yellow lines. 5th instar: Horns almost completely disappear and body becomes more greenish. Head marked as in 4th instar. The whole of the old skin is devoured, including the horns, but not the head. On previous moults, the skin is not always completely eaten. Legs black; prolegs bluish green with black markings. The body as marked as in the previous instar but

the underside is dark brown.

A few hours before abandoning the foodplant the larva becomes orangy brown dorsally (this may happen before or after the last meal). After wandering about for a few days, the larva makes a slight depression on the surface of the soil and prepares to pupate; there seems to be no attempt to go underground. The larval life is about six weeks.

Pupa. Dull blackish. The pupal state lasts from May or early June until about the following February.—JOHN L. GREGORY, 17 Grove Road, St. Austell, Cornwall. 22.x.1971.

PHYLLONORYCTER TRIFASCIELLA HAW. (LEP. GRACILLARIIDAE), AN UPPER SURFACE MINE.—On 22nd October 1971 I noticed a large "Lith"-type mine on the upper surface of a leaf of *Leycesteria formosa*, Himalayan honeysuckle, growing in a ditch, half smothered in nettles, at St. Austell. The plant was little more than a seedling and only about one foot in height. A quick search revealed one more mined leaf, but as this was a normal underside mine of *P. trifasciella* it was not taken. I took the upperside mine home for rearing and, on 18th November, a very diminutive moth emerged. It was not much more than half the size of a normal specimen, although the colour and wing markings were more or less typical.

I had kept the leaf in a small closed container in a warm room, but this did not prevent the partial drying out of the leaf. The pupa broke through the under surface of the leaf for eclosion in the normal manner of the species. I would be interested to hear of any other instances of *Phyllonorycter* mines on the "wrong" side of the leaf.—JOHN L. GREGORY, 17 Grove Road, St. Austell, Cornwall. 31.xii.1971.

EARLY EMERGENCE OF XANTHORRHOE FLUCTUATA L. A moth was seen at a lighted window together with *Oporophthera brumata* L. and *Erannis defoliaria* Clerck, on 21st December last at Gatley, Cheadle, Cheshire.—H. N. MICHAELIS, 5 Glan-y-Mor, Glan Conway. 25.i.1972.

YPSOLOPHUS HORRIDELLUS TREITSCHKE.—Recent notes about this species prompted me to look up my records, and I find that the only two specimens I possess were bred from larvae beaten from blackthorn at Monkswood, Hunts., on 16th June 1963. This partly answers the query of the Rev. David Agassiz as to how much further north of Enfield the species's range extends. Meyrick states that it is found from Surrey and Dorset to Wilts. and Northampton. Like Mr F. A. Swain I see a few *Y. scabrellus* L. in Suffolk each August, but I have only had one *Y. nemorellus* L. and have never seen *Y. horridellus* in the county. According to the late Claude Morley, *Y. horridellus* had never been recorded in Suffolk up to 1937 when he produced his list of the Lepidoptera of Suffolk.—H. E. CHIPPERFIELD, The Shieling, Walberswick, Suffolk. 15.i.1972.

DREPANA CURVATULA BORKHAUSEN IN NORTH NORFOLK.—While on a visit to Norfolk in early January of this year, I paid a visit to Mr Patrick Kearney, who lives at Cley-next-Sea. After an interval of many years, he ran a mercury vapour light trap at the back of his house, which overlooks the marshes. He only started it in August 1971, and by the end of the season had amassed a fine assortment of species including some rarities. On viewing his catch, my attention was at once drawn to a male hooktip which seemed much darker than *Drepana falcataria* L. of which he fortunately had a specimen for comparison. The insect in question was taken on 19th August and had puzzled him not only by its darker hue, but by its markings, which differed notably from those of the pebble hooktip, especially on the underside. There seemed no doubt about its being the dusky hooktip (*D. curvatula*) which was borne out by comparing it with authentic specimens in the Museum at South Kensington, since fifteen were bred by the late Mr Dudley Marsh from a female which was taken by Mr George Youden at Dover on 13th August 1960 and at the time was thought to be an abnormal *D. falcataria*. This is the only other authentic British example (*vide Ent. Record*, 74: 44).

There must be a lot of speculation as to how this insect came to be in this part of north Norfolk, whether a natural migrant or through a possible accidental introduction of the pupa in produce, or still more interesting, whether it might have become a resident and is breeding in that vicinity. This last possibility will have to be investigated in due course.—G. G. M. DE WORMS, Three Oaks, Horsell, Woking, Surrey. 1.ii.1972.

LEUCANIA UNIPUNCTA HAWORTH AND HADENA COMPTA D. & SCHIFF. IN NORTH NORFOLK. Another most interesting capture at Cley by Mr Kearney was the white speck wainscot (*L. unipuncta*) on 11th November 1971. Though this migrant moth appears now regularly in the south-western areas of England, it is still of very rare occurrence on our eastern and south-eastern seaboard, and there are very few records for the eastern counties.

The varied coronet (*H. compta*) has spread rapidly since it was found to be breeding in Kent in 1948, but its appearance at Cley in 1971, also recorded by Mr Kearney, is of special note as I am not aware of it occurring as yet further north than this, though it is now widespread in Suffolk, Kent and Essex, and is turning up regularly in the London area, but its westerly limit still seems to be Buckinghamshire.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 1.ii.1972.

BREEDING MANIOLA JURTINA L. I read Maj. Gen. Lipscomb's article on *jurtina* (*Ent. Record*, 83: 333) with much interest. I have never actually tried to rear it from ova, as all my bred specimens have been obtained by the easier, but neglected, process of sweeping the herbage in suitable localities, late at

night towards the end of June.

Beside meadow brown larvae, I have had gatekeepers (*M. tithonus* L.) and ringlets (*Aphantopus hyperantus* L.) and an astonishing variety of other night-feeding larvae.

The point I wished to stress is that I have found the meadow brown the easiest of butterflies to lay in captivity; just put two or three in a two-pound jam jar with a spray of grass, cover with paper, punch a few holes in this cover, and leave them alone; they will readily jettison their cargo. I have done this on a few occasions and then tipped the ovas on to another site to try to extend the range.

I have, however, successfully reared difficult species like *Mesocidalia aglaia* L. and *Argynnis selene* D. & Schiff. Alas, my sweeping days are now over, but I can commend the method to brother collectors, who, I am sure, will be gratified by the results.—L. G. F. WADDINGTON, 9 Greenleaf Ave., Wheatley Hills, Doncaster, Yorks. 18.i.1972.

ON THE EGG OF *G. RHAMNI* (LEP.):—Most of our reference books say that the eggs of the Brimstone Butterfly (*Gonepteryx rhamni* L.) turn colour from “yellowish” to “purplish grey”, or “deep grey”, shortly before hatching. Moreover, the larva is merely described as “green”.

The pale lime-green eggs laid for me on 28th June 1971 soon turned yellow and matured to a deep buttercup yellow within a week. Keeping casual watch for the alleged colour change, half of the hatch on 6th July was lost and only the last few were observed next day. Here was no colour change; simply a very slight fading as the bright yellow young larva formed within its glassy shell, then ate its way out and left its clear shell standing. The larvae remained bright yellow for two days before donning the green.—C. F. COWAN, Little Gaddesden House, Berkhamsted, Herts. 21.i.1972.

VANESSA ANTIOPA L. AT STEEPLE BARTON, OXFORDSHIRE.—On the morning of 23rd October 1971 I saw an extremely large butterfly fly past the window of the Vicarage, and shortly afterwards my wife told me that she had seen a specimen of this species at close range, sunning itself on the south side of a cottage which is only fifty yards from here. Unfortunately, I was unable to catch sight of it again, but my wife knows this species very well as she has observed it on many occasions elsewhere. It was also seen by one other person who had no entomological knowledge, but who described it to me. I have no doubt that this record is correct.—H. B. D. KETTLEWELL, Steeple Barton Vicarage, Oxfordshire. 27.i.1972.

Obituary

A. H. SPERRING

A. H. SPERRING died on January 17th, in his eighty-third year. A Devon man by birth, he came to Hampshire at the age of three months when his family moved to Southsea. He was educated at Portsmouth Southern Grammar School and Culham College, Abingdon. After leaving college he became a schoolmaster by profession and taught at Blackheath until volunteering for military duties in the First World War, spending three and a half years on the Western Front. In 1919 he returned to Hampshire to resume his scholastic career, from which he retired in 1951, having moved in the meantime to Havant where he lived for the remainder of his life.

Lepidoptera seems to have held a fascination for him since his childhood days when his mother took him to the doctor and he noticed a case of butterflies decorating the surgery wall and, encouraged by his elder brother, C. W. Sperring, also a member of the 'South London' until his death almost twenty years ago, the entomological interest began and was never to be lost.

Although latterly A.H.S. used a mercury vapour lamp the major portion of his collection was acquired the hard but more rewarding way: the beating tray, the sugar patch, acetylene lamp and pupae digging in the winter. Employing these methods no doubt made him the first class and untiring field worker he was. Fortunate enough to have lived within easy reach of the then-unspoiled Havent Thicket he took there *C. sponsa*, *C. promisa*, *M. orion* and many more of our rare species.

In the thirties he joined the South Hants Natural History Society, spending much of his time collecting with Fassnidge, Castle-Russell and Parkinson-Curtis in the New Forest and Southampton area. Many other expeditions were also made with A. J. Wightman.

He joined the 'South London' in 1947 and for many years never missed a meeting; he also took part in the field outings occasionally accompanied by his family.

When collecting on Exmoor in 1939 he discovered a most unusual aberration of *Lygris testata* which Cockayne named *sperringii*.

The writer first met Sperring at Titchfield over twenty years ago looking for *H. nonagria*. This chance meeting was to be the prelude to numerous excursions together which were to continue until eighteen months ago. His health had been failing for several years and it was only his interest and his enthusiasm that enabled him to carry on for so long.

He was an ideal companion to work with in the field and the generosity and welcome which I was accorded when I visited his home will always be remembered with pleasure.

He leaves a daughter, to whom our sympathy is extended.

F.C.S.

Current Literature

Termites, Their Recognition and Control (Second Edition)

by **W. V. Harris**, O.B.E., D.Sc., F.I.Biol. xiii + 186 pp. + 56 photographic illustrations, including eight in colour.

This book is in the Tropical Agricultural Series published under the editorship of D. Rhind, C.M.G., O.B.E., B.Sc., F.L.S., F.I.Biol.

After the lists of contents and plates the introduction to the first edition is reprinted and followed by a short introduction to the second edition, pointing out that although the scope of the second edition is the same, chapters 5, 6 and 8 have been rewritten to fall into line with new discoveries over the past ten years. It also calls attention to the necessity for certain changes in nomenclature.

Chapter 1 is headed "Termite Biology—The Individual" and, after a short explanation of the life of termites under headings concerned with external anatomy with sub-headings: The Winged Adult, The Reproductives, the Worker and the Soldier, with illustrations of the insects and portions of their anatomy, enabling them to be distinguished, the heading Development follows explaining the incomplete metamorphosis of egg, nymph, imago. Details of the life cycle of the imago, the worker, and the soldier are given. The chapter closes with Foods and Feeding, with details of the alimentary canal.

Chapter 2 deals with the Termite society and is divided into Colony Foundation, Caste Determination, The Nest, Termite architecture, Termitophiles, Some Enemies of Termites, and Termites as Food for Man. Chapter 3 is concerned with classification, with a key to the families, followed by drawings of anatomical characters, mostly heads. A list of references, classified geographically for faunal lists and keys for the determination of species follow and the chapter concludes with a phylogenetic list of the genera of Termites arranged in families and sub-families.

Chapter 4, Termites and the Soil, opens with a general discussion of the habits of various groups of termite families, based on the disposal of the spoil from the construction and maintenance of their nests, finally dividing them into three groups. The next eleven pages are devoted to their effects on the soil. Chapter 5 discusses Termites injurious to agriculture, and concludes with a list of pest species classified under the various crops affected, giving the geographical distribution of each species mentioned, while Chapter 6 deals with forestry pests, tabulating the species under the headings of In Nurseries and Young Trees, and On Mature Trees. Chapter 7, headed Timber, gives a list of termite-resistant commercial timbers, followed by Wood Preservation viewed from the standpoints of preservative chemicals and the suitability of various timbers for treatment.

Chapter 8 is concerned with Termite damage to buildings, mentioning the kinds of termites attacking buildings, and their destruction. Measures to prevent Termite damage to buildings, divided into mechanical and chemical barriers are suggested with information as to dosage. A list of species injurious to buildings is given with the geographical range of the species mentioned. These are listed under families, and again under regions. Chapter 9 deals with damage to materials other than timber, listing under organic materials paper, fabrics, leather and rubber, while under inorganic materials, metals and plastics. The question of packaging materials and cable insulations is discussed.

Appendix 1 gives notes on some chemicals used in termite control. A bibliography of 175 titles arranged alphabetically under authors, and the index conclude the work.

The book is well printed on good paper and bound in a strong cloth, suitable for the handling which may be expected for such a subject. Its interest must be wide, covering as it does, the entomologist and student, through various commercial undertakings and agriculture, to ordinary householders in the countries affected.—S.N.A.J.

British Arachnological Society. Bulletins of the Flatford Mill Spider Group and the British Spider Study Group, 1959-1968. Pp. 365. Reprinted facsimile E. W. Classey Ltd., Hampton, Middlesex, England. 1971. £10.

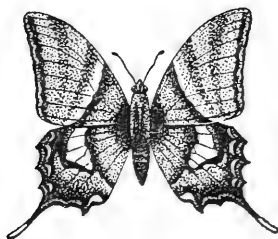
The Flatford Mill Spider Group was formed by a number of people who met at the Flatford Mill Field Centre where, during the 1950's, several spider study courses were held. They exchanged information of interest through these bulletins and after five years the group (having grown very considerably) changed its name to The British Spider Study Group. After another five years—having grown even larger and acquired a world-wide membership—the group became The British Arachnological Society.

The articles in this collection cover a wide range. There is a fair amount of practical advice for beginners about methods of collecting, the making of useful gadgets and available apparatus, including the addresses of suppliers. There is a great deal of ecological information, descriptions of places visited all over the British Isles, together with lists of the spiders found there. The refindings of long lost rarities are triumphantly recorded, observations on behaviour noted and difficulties in identification and nomenclature discussed.

Particularly useful are the New County Records, additions to the county lists in volume I of Dr Bristowe's "The Comity of Spiders" (Ray Society, London, 1939). The B.S.S.G. began to take an interest in other arachnids and there are several articles on harvestmen (Opiliones) including a summary of the keys available for identifying harvestmen.

An introduction by Mr John Parker (secretary of the B.A.S.) gives the history of the organisation.

Indexes of the titles of the articles and the arachnids mentioned in the first 20 bulletins are to be found after the introduction and those for bulletins 21-40 are between bulletins 20 and 21. Unfortunately the pages of the bulletins are not numbered consecutively and it is not easy to find one's way about in the volume. Nevertheless, there is a lot of sound advice and fascinating information in this book and anyone who is seriously interested in spiders will find it well worth while.—F.M.M.



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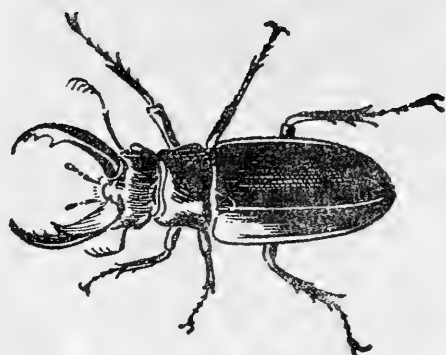
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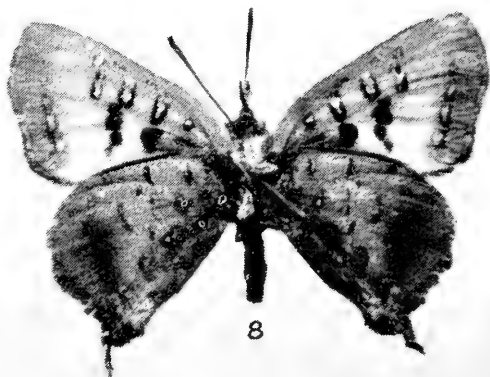
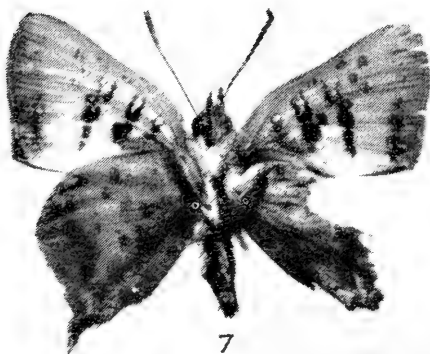
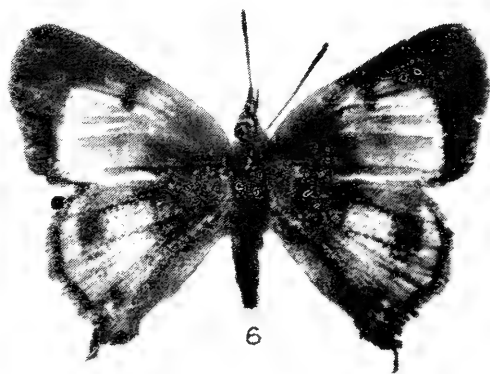
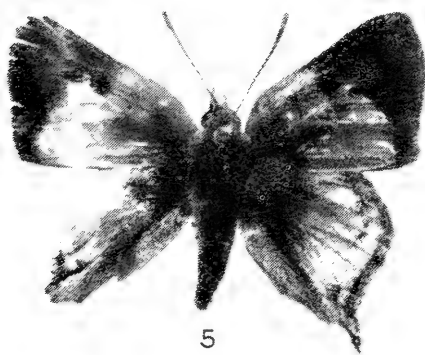
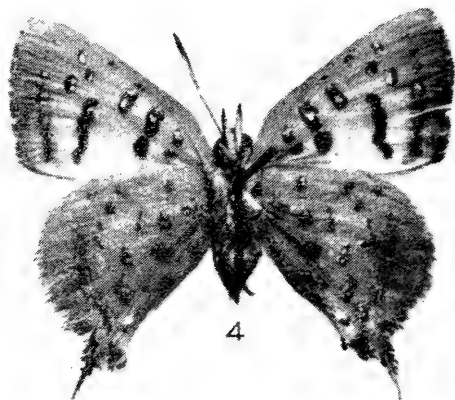
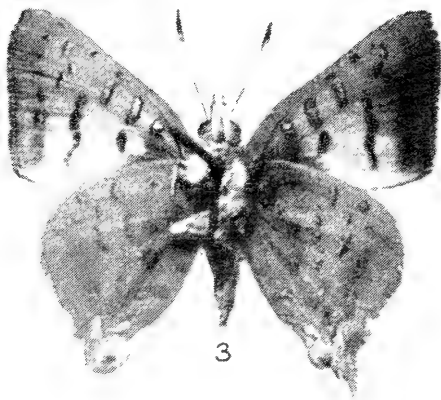
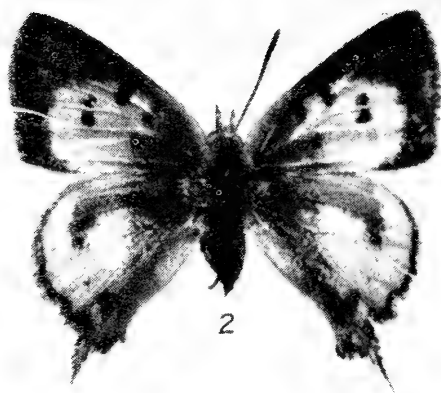
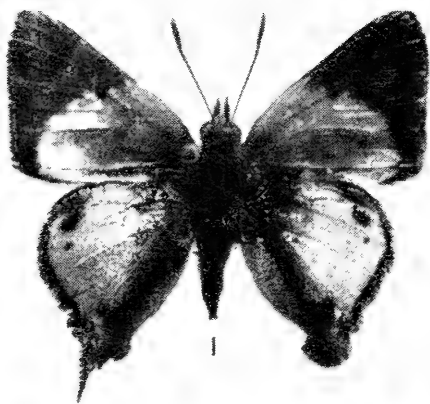
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A Study of *Poecilmitis phosphor* (Trimen) (Lepidoptera : Lycaenidae)

By C. D. QUICKELBERGE
East London Museum

Ever since its initial discovery by J. H. Bowker roundabout 1864 on the Bashee River, eastern Cape Province, this intriguing and unique species has been the classic Lepidopterist's prize. Few there be that have tracked this brilliant, bronzy-red little copper down in its rain-forest domain. Except perhaps for K. M. Pennington who is fortunate enough to live on its doorstep, this species is definitely one that nobody can confidently expect to see at any particular place or time. Innumerable visits by the author to procure specimens in a spot near Stutterheim, Cape Province, where L. Schroder had the good fortune of netting the first specimen, were quite without result. Then again, one year, when a spot nearby was eventually found that appeared to support a strong colony, no more was seen there again for many subsequent years.

From the time that Bowker caught the first three specimens, all females, in the eastern Cape during the 1860s, a period of over 50 years was to elapse before another specimen was found. This was in 1921 when Higgins caught a female at Eshowe, Natal. However, it was only after another 12 years that the species was found in appreciable numbers when K. M. Pennington discovered a colony in the Methley's garden next to his present home near Balgowan, Natal.

The only species of its kind to inhabit forests, it is evident from observations that the secretiveness of *phosphor* is no doubt attributable to its small size, rapid flight, wariness (especially males) and the strong possibility that it keeps well out of sight by haunting the canopy. Swanepoel and Pennington record them sporting about tree-tops and the author has seen them coming down to settle on roads and then depart again at great speed for the heights. However their speed of flight and smallness make it extremely difficult to tell from just where they come and ultimately spend most of their time. Puddles of water on forest roads, at times, attract specimens, mostly females, and in this position they are quite easy to net but

Plate V. *Bowkeria phosphor* subspecies ×1.95

- 1 and 2. Uppersides of male (holotype) and female (allotype) *B. p. borealis* resp.
- 3 and 4. Undersides of male (holotype) and female (allotype) *B. p. borealis* resp.
- 5 and 6. Uppersides of male (neallotype) and female *B. p. phosphor* resp.
- 7 and 8. Undersides of male (neallotype) and female *B. p. phosphor* resp.

wandering males are another matter. They suddenly appear, settle for but just a few seconds and then rocket off again to quickly disappear from sight.

There is little doubt that *phosphor* must inhabit many of our eastern montane forests from the east Cape through Natal and up to the Transvaal but up until fairly recently there were only about six spots over this vast stretch where the species had been located. Recent collecting activities have only slightly extended our knowledge of its distribution. In the east Cape we now know of six spots, in Natal three, and in the Transvaal one. Vast tracts occur between known localities. Coastal forests are shunned. Although primarily a true forest dweller it is evident that *phosphor* will on occasions follow water-courses away from the main forest block provided these are reasonably well wooded. Such a situation was encountered personally at the foot of the Amatola mountains near Debe Nek, Eastern Cape, where one April quite a few specimens of *phosphor* were seen playing about along the tree-tops of a narrow fringe of trees bordering a small stream which emerged from a forest about half a mile away. Even more surprising was the capture of a lone specimen near Fort Beaufort which not only represents the most westerly point known to be reached by the species but also indicates just how far *phosphor* may venture away from forests. According to Mr J. C. McMaster, its captor, the nearest forests are on the Katberg mountains about 15 miles away in a northerly direction. Presumably the insect, which was caught on the wooded banks of the Kat River, had wandered down along this watercourse as this river rises in these mountains. That they are attracted to flowers, e.g. bramble, has been shown by both Swanepoel and Pennington—such fortune has not been mine in spite of a profusion of brambles in flower along forest roads through its haunts in the east Cape. At his home near Balgowan Mr K. M. Pennington has also observed *phosphor* visiting the following flowers:—Chrysanthemum, Mesembrianthemum, Dahlia, Blackjacks, and Canary Creeper.

In common with other species of *Poecilimitis*, *phosphor* appears to have a prolonged flight period and has been observed during most months of the year. One male came down to the road near Stutterheim during August when it was clear, but wintry conditions and chilly winds still prevailed.

In keeping with the general dearth of knowledge concerning this butterfly, the early stages and foodplant are likewise unknown. All that is known in this regard is the appearance of the egg which was squeezed from a female (see fig. 1).

TAXONOMIC DISCUSSION

It has long been felt that the generic placing of *phosphor* is unsatisfactory, but, apart from much speculation, no study-based conclusions have been forthcoming which might allocate the species to a more appropriate genus if such exists.

Most workers have seen closest kinship with *Axiocerses*

Hübner but nevertheless still follow general convention in allowing *phosphor* to remain grouped under either *Phasis* Hübner, *Poecilmitis* Butler or *Zeritis* Boisduval. Others have hinted at the possibility of a generic home for *phosphor* in *Chloroselas* Butler, *Desmolycaena* Trimen, *Aphnaeus* Hübner, *Crudaria* Wallengren and even *Deudorix* Hewitson.

Little study was necessary to reject *Axiocerses* as, taking the species *bambana* Grose Smith as an example, it was found that antennae, palpi, venation and genitalia all showed conclusively that there is no affinity to *phosphor* at the generic level whatsoever, bar a resemblance of their tails. Similar

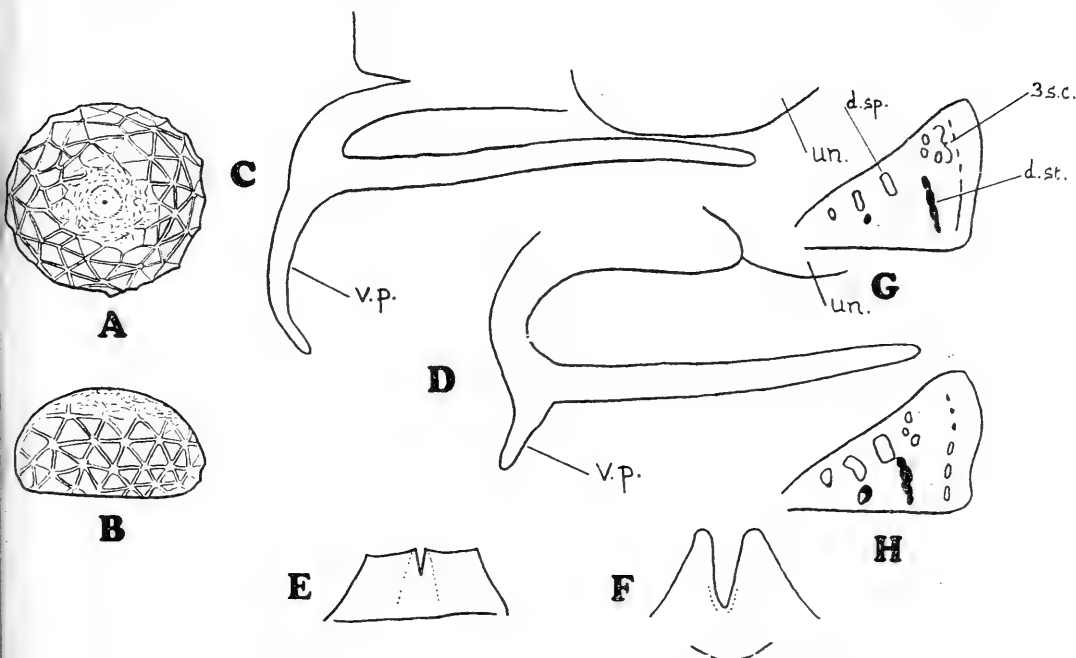


Figure 1. A and B Egg of *B. p. phosphor* (Trimen), 0.79 mm. in height and 0.47 mm. in diameter

A—dorsal view, much enlarged.

B—ventral view, much enlarged.

C, D, E and F—genital structures showing comparison between *B. p. phosphor* (Trimen) and the type-species of *Poecilmitis*, i.e. *P. lycegenes* (Trimen).

C—Subunci of *B. p. phosphor*.

D—Subunci of *P. lycegenes*.

E—Lower culture or anellus of *P. lycegenes*.

F—Lower culture or anellus of *B. p. phosphor*.

v.p.=ventral process un.=uncus.

G and H—Forewing undersides of the two subspecies of *B. phosphor*, illustrating different placement of black discal stripe (d. st.) and cluster of three spots (3 s.c.) in relation to the discocellular spot (d. sp.). In *B. p. phosphor* (H) these are positioned more proximally so that the black discal stripe makes contact with the discocellular spot. In *B. p. borealis* (G) both the discal stripe and three-spot cluster are more distally placed. Note also fuller development of spots in *B. p. phosphor*.

studies also made it quite clear that *phosphor* could not be united with any of the other genera mentioned above, excluding *Poecilmitis*. Only when considering the latter genus do we find some definite closer relationship and it was in this connection that more careful study was called for in order to ascertain if *phosphor* was well placed in *Poecilmitis* or whether it should be isolated generically.

The most compelling case for *phosphor*'s retention within *Poecilmitis* is the apparent uniformity of the genitalia of the species (*vide* Murray, 1958). However, a little closer study does reveal a few fundamental differences not readily discernible but sufficiently important in my estimation as to consider discrete generic grouping for *phosphor*.

These differences in the genitalia, although small in themselves, do appear of sufficient magnitude when compared with the much smaller differences that serve to separate other *Poecilmitis* species. Figure 1 illustrates the genitalic differences between *phosphor* and the type-species of *Poecilmitis*, *P. lycegenes* (Trimen). The point to note in this connection is that the shape of the lower fulture in *lycegenes* agrees in essence with other *Poecilmitis* spp., especially *chrysaor* (Trimen), *aethon* (Trimen), etc. The structure of this part in *phosphor* however has no true counterpart in other species of *Poecilmitis* studied, e.g. *thysbe* (Linnaeus), *pyramus* Pennington, *nigricans* (Aurivillius), *lyncurium* (Trimen), etc. These species also have the shorter ventral process to the subunci as in *lycegenes* whereas that of *phosphor* is long and curved. Oddly, *phosphor* is not entirely unique in this respect in that the same process in *chrysaor* is somewhat similar but the subuncus shows other divergences.

However, should the whole case for removing *phosphor* from *Poecilmitis* depend entirely on the extent of dissimilarity of its male genitalia then we could perhaps still harbour suspicions of doubt, but as will be appreciated from what follows, the matter of *phosphor*'s generic uniqueness is put beyond question.

1. Antennae conspicuously reddish-tipped from above in males, at least last 4-5 segments—not so in other species, *lycegenes*, etc.
2. Labial palpi. Terminal joint noticeably shorter than in other *Poecilmitis* spp., including *lycegenes*.
3. Wing-shape quite different to *lycegenes*, etc. Whereas in the latter species the outer margins are convex, in *phosphor* they are straight in sections or even concave.
4. The structure and presence of a tail again makes *phosphor* unique when viewed together with other *Poecilmitis* species. The few species that do possess tails have them more rudimentary and of a different character as in the case of *chrysaor* where the whole configuration of this structure is different. Thus *chrysaor*'s tail is much shorter and clavate while that of *phosphor* is longer well developed, attenuated and acuminate and with a well de-

veloped basal lobe.

5. Wing-pattern. In all *Poecilmitis* species there is a remarkably characteristic and uniform arrangement of the upper-side black discal spotting over the reddish-coppery ground colour. This is quite lacking in *phosphor* and although there is in some specimens a greater or lesser development of a sub-marginal row of black spots in the *Hw.* and some *Fw.* discal spotting in some females, these are so different in form, arrangement and position as to appear not to be homologous at all. The unusually wide black border of the *UpFw.*, especially broad in the apical portion of the male, is also a conspicuously unique feature.
6. Early stages. Although only the egg is known this does give some positive indication that *phosphor* is not typical of *Poecilmitis*. Referring to the interesting publication of Clark & Dickson (1956) it will be seen that there is at least one marked difference in the egg sculpture between *phosphor* (see fig. 1) and that of the seven species of *Poecilmitis* figured in this paper. In *Poecilmitis* the egg surface is moulded into rather deep hexagonal indentations but in *phosphor* this is developed into a reticular or lace-work pattern, the indentations also being far shallower. This egg-pattern of *phosphor* actually places it closer to that of an *Aloeides*, although it also bears some resemblance to *lycegenes* (Clark & Dickson, 1971) but lacks the vertical ribbing.
7. Finally, even in matters of habits and habitat *phosphor* stands alone. In South Africa there is no other case of a copper, let alone a *Poecilmitis* sp., being bound to a forest habitat and, even more odd, favouring the canopy. The extreme wariness of males and especially their tendency not to return to resting spots also marks this species off from its congeners.

Although this discussion has emphasized the points of difference between *phosphor* and the general run of *Poecilmitis* species, the actual placing of *phosphor* in relation to its congeners in a taxonomic table or key certainly puts it easily within the old *Phasis* group of Aurivillius (in Seitz, 1925). In his breakdown of *Phasis*, *phosphor* would conveniently form a third group, i.e. 2(c) to his second major subdivision thus showing closest relationship to *Aloeides* and *Poecilmitis*. Of these two latter genera *phosphor* obviously approximates closer to *Poecilmitis* but nevertheless must have diverged from this genus at a comparatively early stage, while still retaining some visible ties with *Aloeides* as evidenced by the egg sculpture. It is possible that upon taking to a forested habitat *phosphor* became isolated enough to develop other notable differences.

In choosing a generic title for *phosphor* no more appropriate name than *Bowkeria* **gen. nov.** could be suggested as a fitting tribute to the zeal of the intrepid Colonel James Henry Bowker, who discovered this and many other interesting species during

his pioneer, collecting activities about the eastern Cape and Natal. I am indebted to Mr C. G. C. Dickson for proposing this name.

During a recent study of a fair series of specimens of *phosphor* from the Cape, Natal and Transvaal it became obvious that two taxa were involved. Murray did not suspect this when he described a Balgowan male in his book of 1935. As his description of the female (*ibid.*) was only an adaption of Trimen's initial description of the holotype (a female of the nominate subspecies) this left the curious situation of the *borealis* female and *phosphor* male as being as yet undescribed. This defect is remedied herein.

Bowkeria phosphor borealis
ssp. n.

Phasis phosphor (Trimen) Murray, 1935. *South African Butterflies* p. 109 (part.).

Holotype: Male, Yellowwoods, Natal, 24/4/1964 (K. M. Pennington).

Allotype: Female, Balgowan, Natal, 18/4/1943 (K. M. Pennington).

Paratypes: 8 males and 6 females consisting of 2 males and 1 female from near Graskop, Transvaal and the rest from the type locality.

Description of Holotype male: Glittering orange-red with black markings.

FwUp.: Almost half of the distal section is black, especially broad apically, narrowing towards tornus and projecting slightly inwardly along inner-margin. The boundary line between black and orange-red reaches the costa near cell-end where a black marking projects to close the cell.

HwUp: Orange-red, except for a black clouding at base and along inner-edge, a blackish blotch on margin of area 7 and evidence of submarginal black spotting reduced to areas 1, 5 and 6, the spot in area 5 being much smaller than the one in 6. A thin black line borders the outer margin. A lobed tail, tipped white, extends from the tornus.

Un.: Varying shades of ferruginous brown liberally adorned with metallic spots and streaks. Opposite the *Up.* orange-red of the *Fw.* the underside is also similarly coloured, only lighter and not glistening. Also in this area are some black markings and a black discal stripe.

A male specimen of this race is figured in colour by Murray (1935).

Allotype female: Paler, purer orange than male, not so bright; wing shape more obtuse.

FwUp: Basal parts dusky-suffused. Discal areas bear 5 black spots, the one closing the cell the largest and the others grouped into 2 pairs on either side but below discocellular spot, the proximal pair more separated than the distal pair. Cilia orange-suffused along hind-margin clearer from apex and fading towards tornus, also narrowly fringed whitish but this

is only really visible when viewed under a low power lens. Black border not as broad as in males, in the apical area, but somewhat broader towards tornus.

HwUp.: Basal-costal area darker and more extensively dusky-suffused than in *Fw.* or the male *Hw.* This suffusion links up with the submarginal spotting to form a tapering pointed downward curve, as in a half-crescent. Cilia variable.

Underside similar to the male but rather paler throughout.

Distribution: Known only from near Balgowan (e.g. "Yellowwoods" farm), the Karkloof Falls area and from the vicinity of Eshowe in Natal, extending up to the escarpment forests of the eastern Transvaal as at Gaskop.

Remarks: Although this subspecies of *phosphor* has been known since its discovery in Natal in 1921 and 1933 its distinctness was not suspected mainly because the male of the eastern Cape form was not discovered until 1962 when L. Schroder caught one near Stutterheim. In addition, very few females of the latter form were extant and so it was only during 1963 when the author began amassing a goodly number from the neighbourhood of Stutterheim that the differences separating these two subspecies became more clearly apparent.

Transvaal specimens, of which I examined only two males and one female, were found to be identical to Natal examples.

Bowkeria phosphor phosphor (Trimen)

Comb. n.

Zeritis phosphor Trimen. 1864. *Trans. ent. Soc. London* 3 (2): 178 Bashee River, Caffraria.

Neallotype: Male, Stutterheim, Cape Province, 22/8/1964 (C.D. Quickelberge).

Additional material: Six males of which four are from Stutterheim, one from Debe Nek and one from Fort Beaufort; also eight females all from Stutterheim.

Description

Neallatype Male: Glittering reddish-orange with black borders and markings. Differs from the female in much the same way as sexes differ in the above description of *borealis* (see also *Differential Diagnosis*). Cilia whitish-fringed in *Fw.*, brownish in *Hw.*

FwUp.: Discocellular spot large and prominent. Two minute black spots in cell.

HwUp.: Basal black scaling extends as a black suffusion (not altogether obscuring the orange ground-colour) well over discal area nearly to the half-way mark. A faint black line closes the cell. Submarginal row of black spots only absent in areas 2 and 3 although under a lens some faint indication of incipient spotting is visible in the form of dark individual scales in these area, especially in area 2. ...

Un.: Very similar to female except that there is less metallic scaling of the *Hw.* spots, many lacking this feature altogether.

Distribution: Found in the eastern Cape Province in forests covering higher ground i.e. off the coastal strip and stretching from Fort Beaufort through Debe Nek, Stutterheim and Ama-bele to the Tsomo and Bashee Rivers.

Remarks: Through the kindness of Mr G. E. Tite I was able to examine colour photographs of the holotype female of *phosphor* lodged at the British Museum. An examination of these left no doubt that this specimen is one of the nominate subspecies, thus necessitating the allocation of a new name to the Natal/Transvaal subspecies. Unfortunately the holotype, a female caught by J. H. Bowker near the Bashee River, bears no date of capture but from inference must have been caught between the years 1860 and 1864. It is figured in colour by Trimen (1866).

Owing to the apparent close resemblance between the two subspecies of *phosphor* the following diagnosis was prepared. Much time has been devoted to the study of these two forms and I have no doubt that they constitute two distinct taxa. As often is the case when studying allopatric populations no surety was reached as to whether the two forms were only subspecifically distinct or whether two species were involved. Until more is known about this species and the matter can be studied on a broader basis it was decided that it would be safer to relegate the two taxa to subspecific rank, leaving the way open to elevation to specific rank should evidence for this come to light later. This possibility is by no means remote, the differences appearing to me to be more of specific import.

Differential Diagnosis

Based on 29 specimens altogether, comprising 8 females and 7 males of nominate *phosphor* and 8 males and 6 females of *B. p. borealis*.

Male Up.: In general outline the wing-shape in *borealis* is more angular or acute compared with the squatter, more obtuse lines, of the nominate race. This difference of build is even reflected in the markings or spots, which are narrower and less rounded in *borealis* than those of nominate *phosphor*. This is especially apparent in the markings of the *Un.* but on the upperside the effect is also discernible in the shape of the conspicuous black spot closing the cell on the *UpFw.* which in *phosphoris* a prominent spot whereas in *borealis* it is better termed a bold streak. The tails also tend to differ along similar lines in that in *borealis* they are long and straight, not as twisted and short as in the east Cape form.

In general *Up.* appearance *borealis* is a more striking insect due mainly to its crisp, more clear-cut lines. Nominate *phosphor* is by contrast somewhat duller and more blackish-suffused on the *UpHw.* about base, costa and inner margin. On this wing there is also a more extensive development of the submarginal row of black spots in *phosphor* and in one specimen even the veins of the *UpHw.* are suffused with black. In *phosphor* these submarginal spots are usually only absent in

areas 2 and 3, being always present in area 4. *Borealis* usually has spots present only in areas 5 and 6 with a few specimens having them in 4 as well.

Male Un.: The predominant brown coloration is darker and of a somewhat different colour in *borealis*, ranging from ferruginous along the hind-margins of the *Hw.* to lighter tints of the same colour over the rest of the wing. Over these parts *phosphor* is ferruginous on hind-margins, paling to greyish-ochreous elsewhere, sometimes tinged with vinaceous. The spots of *borealis* are more clearly defined and extensively metallic-scaled especially on the *Hw.* where virtually every spot glistens conspicuously. In *phosphor* the spots of the *Hw.* are more diffuse and have no metallic scales except towards the tornus. A few specimens, however, if closely examined have some, but not all, of the discal spots faintly metallic-scaled as well.

Female Up.: In *borealis* the wing shape is, as in the male, more elongate, less square-cut, especially in *Fw.* which also has the outer margin more convex and often less elbowed than in *phosphor*. Also more rounded in *borealis* is the distal margin of the orange ground colour. This margin is often scalloped, this effect being produced by the black of the outer margin penetrating along the veins for short distances. However, this character is variable and only faintly apparent in some specimens which, when like this, are not unlike some of the specimens of *phosphor* which show incipient trends in this direction. Generally, though, *phosphor* lacks any such scalloping.

Tails as in the male *borealis*, i.e. longer and straighter than those of *phosphor*.

On the *UpFw.* *borealis* very often has at least some indication of black spotting over the orange discal areas besides the ever-present well-marked spot closing the cell. Sometimes there may even be 4 well-developed such spots arranged in two pairs. In *phosphor* this discal spotting is either absent or only faintly visible, never as well-developed as is normal for *borealis*.

Female Un. In the *Fw.* the discal row of black spots forming a stripe from areas 1b to 4 terminate against vein 5 at a position either halfway between discocellular spot and the cluster of three spots situated distally towards apex or, as is most often the case, at a point closer to these three spots than to the discocellular spot (see illustration). In all females of *phosphor* this black discal stripe makes contact at its anterior end with the discocellular spot or, if not, very nearly so.

This tendency towards the bunching up together of the above markings in *phosphor* and the greater spreading out of same in *borealis* is also noticeable in males but is not as easily described or obvious as in females.

Due to insufficient material no thorough examination of a comprehensive series of genitalia dissections of both subspecies has been possible for purposes of comparison. Although

some differences of anellus, valve and uncus shape have been noted this can carry no weight until a greater series can be studied to determine the extent of individual variation in the genitalia of each taxon.

Abbreviations used for wing surfaces are:—*Up*.—upper-side; *Un*.—underside; *Fw*. and *Hw*.—fore- and hind-wings; *UpFw*. and *UpHw*.—uppersides of fore- and hind-wings.

Acknowledgments

My sincere thanks are extended to Mr G. E. Tite of Tring, England, whose assistance in matters too numerous to mention has been of inestimable value. For constant encouragement and help thanks must also go to Mr C. G. C. Dickson of Cape Town. For the loan of specimens I wish to thank Messrs K. M. Pennington, Lionel Schroder, D. A. Swanepoel, J. C. McMaster and C. G. C. Dickson. Finally, a special word of thanks to Mr Pennington for sharing with me his rich fund of knowledge, gained at first hand, of this beautiful and interesting species.

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Joint Committee for the Conservation of British Insects.

c/o Royal Entomological Society, 41 Queen's Gate, London S.W. 7

A CODE FOR INSECT COLLECTING

This Committee believes that with the ever-increasing loss of habitats resulting from agricultural, industrial, urban and recreational development the point has been reached where a code for collecting should be considered in the interests of conservation of the British insect fauna, particularly macrolepidoptera. The Committee considers that in many areas this loss has gone so far that that collecting, which at one time would have had a trivial effect, could now affect the survival in them of one or more species if continued without restraint.

The Committee also believe that by subscribing to a code of collecting entomologists will show themselves to be a concerned and responsible body of naturalists who have a positive contribution to make to the cause of conservation. It asks all entomologists to accept the following code.

1. *Collecting — general*

- 1.1 No more specimens than are strictly required for any purpose should be killed.
- 1.2 Readily identified insects should not be killed if the object is to 'look them over' for aberrations or other purposes: insects should be examined while alive and then released where they were captured.
- 1.3 The same species should not be taken in numbers year after year from the same locality.
- 1.4 Supposed or actual predators and parasites of insects should not be destroyed.
- 1.5 When collecting leaf-mines, galls and seed heads never collect all that can be found; leave as many as possible to allow the population to recover.
- 1.6 Consideration should be given to photography as an alternative to collecting, particularly in the case of butterflies.
- 1.7 Specimens for exchange, or disposal to other collectors, should be taken sparingly or not at all.
- 1.8 For commercial purposes insects should be either bred or obtained from old collections. Insect specimens should not be used for the manufacture of 'jewellery'.

2. *Collecting — rare and endangered species.*

- 2.1 Specimens of species listed by this Committee (and published in the entomological journals) should be collected with the greatest restraint. As a guide, the Committee suggests that a pair of specimens is sufficient, but that those species in the greatest danger should not be collected at all. The list may be amended from time to time if this proves to be necessary.
- 2.2 Specimens of distinct local forms of Macrolepidoptera, particularly butterflies, should likewise be collected with restraint.
- 2.3 Collectors should attempt to break new ground rather than collect a local or rare species from a well-known and perhaps over-worked locality.
- 2.4 Previously unknown localities for rare species should be brought to the attention of this Committee, which undertakes to inform other organisation as appropriate, and only in the interests of conservation.

3. *Collecting — lights and light-traps.*

- 3.1 The 'catch' at light, particularly in a trap, should not be killed wholesale for subsequent examination.
- 3.2 Live trapping, for instance in traps filled with egg-tray material, is the preferred method of collecting. Anaesthetics are harmful and should not be used.
- 3.3 After examination of the catch the insects should be kept in cool, shady conditions and released away from the trap site at dusk. If this is not possible the insects should be released in long grass or other cover and not on lawns or bare surfaces.
- 3.4 Unwanted insects should not be fed to fish or insectivorous birds and mammals.

- 3.5 It a trap used for scientific purposes is found to be catching rare or local species unnecessarily it should be resited.
- 3.6 Traps and lights should be sited with care so as not to annoy neighbours or cause confusion.
- 4. *Collecting — permission and conditions.*
- 4.1 Always seek permission from landowner or occupier when collecting on private land.
- 4.2 Always comply with any conditions laid down by the granting of permission to collect.
- 4.3 When collecting on nature reserves, or sites of known interest to conservationists, supply a list of species collected to the appropriate authority.
- 4.4 When collecting on nature reserves it is particularly important to observe the code suggested in section 5.
- 5. *Collecting — damage to the environment*
- 5.1 Do as little damage to the environment as possible. Remember the interests of other naturalists; be careful of nesting birds and vegetation, particularly rare plants.
- 5.2 When 'beating' for lepidopterous larvae or other insects never thrash trees and bushes so that foliage and twigs are removed. A sharp jarring of branches is both less damaging and more effective.
- 5.3 Coleopterists and others working dead timber should replace removed bark and worked material to the best of their ability. Not all the dead wood in a locality should be worked.
- 5.4 Overturned stones and logs should be replaced in their original positions.
- 5.5 Water weed and moss which has been worked for insects should be replaced in its appropriate habitat. Plant material in litter heaps should be replaced and not scattered about.
- 5.6 Twigs, small branches and foliage required as foodplants or because they are galled, e.g. by clearwings, should be removed neatly with secateurs or scissors and not broken off.
- 5.7 'Sugar' should not be applied so that it renders tree-trunks and other vegetation unnecessarily unsightly.
- 5.8 Exercise particular care when working for rare species, e.g. by searching for larvae rather than beating for them.
- 5.9 Remember the Country Code!
- 6. *Breeding*
- 6.1 Breeding from a fertilised female or pairing in captivity is preferable to taking a series of specimens in the field.
- 6.2 Never collect more larvae or other livestock than can be supported by the available supply of foodplant.
- 6.3 Unwanted insects that have been reared should be released in the original locality, not just anywhere.
- 6.4 Before attempting to establish new populations or 'reinforce' existing ones please consult this Committee.

13th September 1971

Butterflies in Yugoslavia 1971

By A. G. IRWIN F.R.E.S.

(Concluded from p. 69)

- **Minois dryas* Scop. Near Aleksin Han, July 10-Aug. 9. Boračko Jezero, Aug. 22.
- Erebia euryale* Esp. Boračko Jezero, July 25. (500m — a low altitude for this species).
- **Maniola jurtina* L. SL — 800m. July 10-Aug. 30. Widespread.
- **Coenonympha pamphilus* L. SL — 800m. July 11-Aug. 30. Widespread.
- (Intermediate between normal form and f. *lyllus*).
- **Coenonympha arcania* L. 150m.-500m. July 25-Aug. 30. Local.
- **Pararge aegeria tircus* Butler. SL — 800m. July 12-Aug. 30. Widespread.
- Lasiommata megera* L. SL — 800m. July 11-Aug. 29. Widespread.
- Lasiommata petropolitana* Fabr. 100m.-500m. July 18-Aug. 2. Local.
- **Hamearis lucina* L. Boračko Jezero, Aug. 10.
- **Strymonidia spini* Schiff. Borci, Aug. 8.
- **Lycaena phlaes* L. SL — 500m. July 18-Aug. 23. Local.
- **Heodes virgaureae* L. Borci, Aug. 8.
- **Syntarucus pirithous* L. Hutovo Blato, July 16-Aug. 23.
- **Cupido minimus* Fuessly. Borci, Aug. 24.
- **Philotes baton* Bgstr. Hutovo Blato, Aug. 23.
- Scolitantides orion* Pallas. Borci, July 23 and Boračko Jezero, July 25.
- **Aricia agestis* Schiff. SL — 800m. July 24-Aug. 28. Local.
- **Aricia allous montensis* Verity. Ostrazac, Aug. 20 (250m. — low for this butterfly).
- **Meleageria daphnis* Schiff. Boračko Jezero, July 25. (Fairly late for this species).
- **Lysandra coridon* Poda. 250m-800m. July 23-Aug. 20.
- Although described as "rare and local" in the Balkans, this butterfly appeared quite widespread).
- **Polymmatius icarus* Rott. SL — 500m. July 12-Aug. 30. Widespread.
- **Pyrgus serratulae* Rambur. Hutovo Blato, Aug. 23-29 and Ostrazac, Aug. 20.
- (4m. — unusually low for this species).
- **Carchardodus alceae* Esp. Hutovo Blato, Aug. 17-23.
- **Hesperia comma* L. Borci Aug. 8.
- **Gegenes pumilio* Hffmsgg. Hutovo Blato, Aug. 23. (This near-coastal region appears to be outside the known range of this skipper.)

The specimens which were taken are to be deposited in the Ulster Museum. It is hoped that some work will be done on them, and an account of variations published in due course.

The full list of records is being sent to the European Invertebrate Survey.

Finally, the expedition members (i.e. the author, M. W. Parry, J. S. M. Albrecht and O. R. Chamerlain) would like to thank all those friends who helped them in England and Yugoslavia.

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Two Collecting Trips in Europe during 1971

(2) THE ALPS OF AUSTRIA AND JUGOSLAVIA

July to August 1971

By C. G. M. de WORMS, M.A., Ph.D., F.R.E.S.

In July 1964 I spent a period at Mallnitz, just south of the Tauern Massif in Carinthia and was joined there by Mr Russell Bretherton with whom I collected a large harvest of the *Erebias* and other choice local species (*Ent. Rec.*, **77** (1965): 55-60). But when we tried for *Erebia claudina* Borkh. (*arete* Fab.), our chief quarry on that occasion, we found most of them were virtually over. We had been told that a cable car was to be built up the mountainside we had arduously ascended, so that I had promised myself to revisit the spot one day under these new and easier conditions for reaching it. The opportunity offered itself this year when Gen. Sir George Johnson invited me to join him on the latter part of his tour in those regions. I made arrangements to do so, but to return to Mallnitz beforehand.

I accordingly set out on the morning of July 19, flying direct to Salzburg where I took one of the expresses that landed me at Mallnitz just south of the Tauern tunnel late that afternoon. I stayed once more at the Kärntnerhof Hotel which had been a very good haven for us in 1964. The next morning I set out early by taxi up the valley towards the tunnel as far as the Alpenrose Hotel, near which was the station of the cable car. Instead of a weary climb of some two hours to its first stop at the Hochalmblick, I was there in a matter of a few minutes, but without any sun. However the clouds cleared about mid-day and immediately the first small *Erebias* started to fly among both short and long herbage just at 7000 ft. These nearly all proved to be males of *E. claudina* in perfect condition, and I was very pleased to see them in such profusion as there were fears the site of the upper cable car station might destroy their chief habitat. With them were also flying a few *E. pharte* Hübn. past their best, together with an occasional worn *E. oeme* Hübn., and fresher *Coenonympha gardetta* de Prunner (*satyrion* Esp.). The only Skipper was the high level *Pyrgus cacaliae* Ramb. It was an encouraging start and the next day, July 21 I revisited another of our haunts of seven years previously. This was the Housleralmblick just to the south of Mallnitz and reached by rather a perilous chair lift up to just

600 ft. Fortunately it was sunny without much wind when I explored a sheltered path where some long grass seemed to harbour a host of *Erebias*, most of which proved to be *E. pharte* with a sprinkling of *E. euryale* Esp. in a very dark form with little markings referable to f. *ocellaris* Staud. Further near a mountain stream there was a host of insects flying. Among the most interesting were males of *Pieris bryoniae* Hübn. in a very heavily veined form. I took fresh males of *Vacciniia optilete* Knoch and *Aricia eumedon* Esp. while the only Skipper obtained turned out to be *Pyrgus andromedae* Wallengren, never a common insect. A few *Boloria pales* Schiff. were also about. Later that day I thought I would revisit a luscious spot under a tall cliff which had been the home of a flourishing colony of *Albulina orbitulus* de Prun. (*pheretes* Esp.) but to my dismay as I approached, I saw from afar a huge bull standing in the very place where this little Blue flew in 1964. As it espied me very aggressively, I beat a hasty retreat. My only further captures were a few male *V. optilete* somewhat worn. I was once more up the Tauern slopes on July 22, a lovely day when the cable car took me to the second station at Hannoverhütte at a little over 9000 ft. but I was surprised not to see any of the high level *Erebias* at this altitude. However, returning lower to the Hochalmblick I found *E. claudina* now in greater numbers than before with the attractive pale females just emerging in which the white pupils on the underside of the hindwings are more pronounced than in the darker male. But an even more interesting member of this ubiquitous genus were males of *E. nivalis* Lorkovič and de Lesse with its rounded forewings and brilliant blue-grey underside. Mr B. C. Warren had particularly asked me to look out for this species at this altitude, since in 1964 some 1000 ft. lower down we took *E. cassioides* Hohenwarth. A few worn *E. pandrose* Borkh. (*lappona* Thunb.) were also also on the wing. I spent a final day in this lovely alpine area on the 23rd in bright sunshine again among a galaxy of these small *Erebias*, interspersed with an occasional *Colias phicomone* Esp. careering over the slopes. For my last morning, through a chance conversation with some tourists, I tried some new ground to the east of the railway station among a thick fir forest where *E. euryale* was swarming. At this lower level of 5000 ft. *Clossiana euphrosyne* Linn. was still flying, with some *Mellicta athalia* Rott. A little higher in the fringe of the tree-line a small glade, some hundred yards square I netted seven species of *Erebia* including *E. claudina*, *E. alberganus* de Prun (*ceto* Hübn.), *E. melampus* Fuessli, *E. manto* Schiff., *E. euryale*, *E. pharte* and *E. oeme*.

A heavy thunderstorm ended the morning's collecting and had hardly cleared in the afternoon when Gen. Sir George Johnson, who had come up from Villach, picked me up in Mallnitz and we drove some forty miles westwards to Heiligenblut at the foot of the Gross Glockner. We put up at the very well-appointed Ruppertihaus Hotel. We set out early on July 25 in brilliant sunshine for the higher alps, but it involved pay-

ing a toll of about £2 for each journey up the big mountain road to the Glockner. On halting near a promising grassy slope half way up we found the area alive with butterflies in the greatest profusion. *Boloria napaea* Hffmsg. was swarming, skimming over the galaxy of flora. The two chief Erebias at this level were *E. pharte* and *E. manto*, while the Blues were mainly represented by *Polyommatus eros* Ochs. and *Cyaniris semiargus* Rott. A few miles further up at just about 7000 ft. we again stopped to sample the luscious slopes. On climbing up a steep bank my first capture was the tiny fritillary *Mellicta asteria* Freyer, apparently in the very area from which Mr B. C. Warren had received specimens some 40 years previously. We found this little insect seemed to hug the driest parts of the slopes where the herbage was shortest and was never to be seen among the longer grass. At this altitude *Erebia nivalis* males were quite numerous while *E. epiphron* Knoch. and *E. melampus* Fuessli appeared with *Euphydryas debilis* Oberthür, the little mountain fritillary like a small edition of *E. aurinia* Rott. The two high level Blues *Agriades glandon* de Prunner and *Albulina orbitulus* de Prunner (*pheretes* Hübn.) were also in fair numbers, but one of the most plentiful species was the little Skipper *Pyrgus sifanicus* Gr.-Grsh. together with *P. cacaliae* in less quantity. We revisited this glorious region with its grand view of the Glockner glacier on the two following days, the 26th and 27th. In addition to the species already mentioned we recorded *Parnassius apollo* Linn. as well as *Hesperia comma* Linn., *Eumedonia chiron* Rott. and *Cupido minimus* Fuessli. Females of *E. nivalis* were just starting. We had a very successful three days under ideal conditions and the rediscovery of *M. asteria* in this area was the most important feature.

A few weeks earlier Gen. Johnson had visited northern Yugoslavia in the hope of seeing *Neptis hylas* Linn. But the second brood had not appeared. So he suggested a return to that country to make a further attempt to see this eastern butterfly in its native haunts. I was naturally very agreeable to this course. So we duly turned southwards on July 28 down the valley to Villach, then on by the new motorway to Klagenfurt. We crossed the Karawanken range by the Loibl Pass, with its grand scenery and then emerged into Yugoslavia from the mile-long tunnel at the summit. Just south of Lubljana we got on to the Autoput which runs through the centre of the country all the way to the Greek border. After some 250 miles from our start we put up at the very comfortable Turist Hotel at Brezice, some 20 miles west of Zagreb which was our venue early the next day. After passing through the city we stopped at the base of a wooded valley to the north to which Gen. Johnson had been conducted by Prof. Lorkovič three weeks before with very good results. As soon as we arrived, we spotted *Neptis hylas* gliding round the bushes, a most attractive insect which proved to be quite numerous, though some specimens were already past their best. Another welcome species as we

ascended the forest path overlooking the gorge, was *Leptidea morsei* Fenton, readily distinguishable from its smaller relative *L. sinapis* Linn. flying with it by its larger size and lighter markings. Many blues were settled on flowers or flitting about the thick herbage. One special slope seemed to harbour the lovely *Meleageria daphnis* Schiff. with blue females as well as *Scolitantides orion* Pall. which needed selecting for good specimens. Among the smaller Lycaenids were fresh *Everes argiades* Pall. and a few worn *E. decolorata* Stgdr. The large Satyrid *Hipparchia fagi* Scop. was dashing up and down the clearing with a few *Melanargia galatea* Linn. We also saw *Nymphalis antiopa* Linn. but *Apatura iris* Linn. which apparently had been so plentiful during the first half of the month, did not put in an appearance. I had, however, a stroke of good fortune in netting a female *Argynnis paphia* Linn. in full flight which turned out to be a remarkable aberration in which the silver bands on the underside hindwings merged into a complete wedge of silver covering half of the wing base, very similar to ab. *argyrorrhyses* Alphéraki which is said to come from the Caucasus. We revisited this fine locality the morning of July 30 and found *N. hylas* again quite numerous together with most of the other insects already referred to, but the sky soon became overcast and we motored up to the top of the local high ground by a very tortuous road through beech woods but very little was on the wing during the afternoon. We set out early on July 31 back westwards, reaching the small town of Kranjske Gora by mid-day. This spot, set in the Julian Alps in the corner of Yugoslavia where it joins both Austria and Italy, had been visited by Dr and Mrs Higgins in 1960 (vide *Entomologist* (1961), **94**: 82-83) when they were like us, in search of *Erebia styx trentae* Lorkovič. Our haven on this occasion was the very modern Prisank Hotel. Later in the day I surveyed the fir woods just south up the adjoining valley. The area was alive with butterflies among which *Erebia ligea* Linn. was most prominent, though many were already imperfect. Other Satyrids were *Pararge maera* Linn. and *Coenonympha arcania* Linn., while *Lysandra coridon* Poda was quite numerous. The chief burnet was *Zygaena transalpina* Esp.

August opened with a very fine and warm day when we set out southwards to go over the remarkable Vrsic Pass with its forty hairpins which has to be negotiated with great care on the descent into the Trenta Valley. Near the base of the southern side of the pass many *Erebias* were flying. Those which hugged the rock faces lining the road were mostly male *E. stirius* Godart which was just starting to appear. But in spite of the sunshine and warmth there were on the whole very few species of butterflies. Somewhat worn *Erebia aethiops* Esp. were fluttering in the woods accompanied by fresh male *E. pronoe* Esp. The only Blue was *Lysandra coridon*. We revisited this area the next three days crossing the pass by this very rugged and tortuous route. On the 2nd we took the first *Erebia styx trentae* with two fine females which were much

brighter and with larger spots than those of *E. sirius* which were also now on the wing. A few *Melitaea didyma* Esp. also flying. On the 3rd we made a halt at the summit of the pass at 5300 ft. but only found *E. epiphron* and *E. euryale*. *Pieris ergane* G.-H. was taken among the rocky wooded slopes. On our final day, August 4, *E. styx* males were more numerous and fairly easy to distinguish from *E. stirius*. We also saw a single *Nymphalis polychloros* Linn. and *Aricia allous* G.-H.

We set out on August 5 from Kranjske Gora on the main road into the corner of Italy turning north at Tarvisio towards Villach. We then followed the road that skirts the Worthersee to the south, stopping near a small marsh which a week earlier had been very productive of *Coenonympha tullia* Mull. On this occasion this species was still on the wing and fresh with some very well-marked females. In fact the whole population in this very restricted locality had the undersides with large eyespots somewhat similar to our Witherslack race which is very unusual for continental forms. Later that day, in very hot conditions, we moved on to Klagenfurt and revisited a piece of ground which had proved very productive in 1964 when I was with Mr R. Bretherton. On this occasion it did not disappoint especially as the species of broom (*Cytisus*) which is the food-plant of *Colias myrmidone* Esp., was in much greater abundance than seven years earlier. It was not long before we saw this fine insect careering about the stubble together with a number of *C. croceus* Fourcroy. They could only be distinguished when netted which was by no means an easy achievement. *Colias hyale* Linn. was also fairly numerous, mainly patronising a patch of lucerne. Among the wealth of species in this spot was *Minois dryas* Scop., *Erebia euryale* Esp., *Argynnis paphia* Linn., *Mellicta athalia* Rott., *Inachis io* Linn., *Everes argiades* Pall. We stayed overnight in Villach and returned to this rich area the following morning, under equally warm weather, seeing nearly all the butterflies of the previous day as well as quite a lot of *Coenonympha iphis* Schiff. and more *Colias* of all three species.

That afternoon we took the car train from Villach back over the Tauern Tunnel thence through Salzburg to Cologne and the Rhine valley, eventually reaching Ostend by midday on August 6. Driving some 80 miles to Boulogne we took the boat ferry to Dover and were back in Surrey late that night after what had been a most enjoyable and successful visit to this delightful part of Europe where we recorded just over 80 species of butterflies.

The Butterflies of the Isle of Wight

By T. D. FEARNCHOUGH

(Concluded from p. 64)

Limenitis camilla Linn. (White Admiral)

The localities for this butterfly given by Morey in 1909

were: Parkhurst Forest, Quarr Copse and Whitefield Wood. Fassnidge added nothing to this in 1923.

Today the species is widespread and locally common. It was still to be seen in numbers in Whitefield Wood until the wood was recently felled. It occurs now at: Parkhurst Forest Firestone Copse, Combley Great Wood, Rowlands Wood, Alverstone, Hamstead, Newton, Whippingham and Cranmore.

Several second brood specimens were seen on blackberries by Miss Newnham in October 1969 at Luccombe.

Ab. semi-nigrina was recorded near Ventnor in 1921 by E. Cornell.

Apatura iris Linn. (Purple Emperor)

Although there are no recent records, one likes to hope the Purple Emperor may still occur in Parkhurst Forest or in the likely looking area between Parkhurst and Hamstead. Very old records are for: Parkhurst, Freshwater, Whitefield, Brading and Yarmouth.

RIODINDAE

Hamearis lucina Linn. (Duke of Burgundy Fritillary)

This species has declined over the years to vanishing point. The 1909 localities were: Borthwood, Combley, Quarr Copse, Apse Down, Totland Bay, Parkhurst Forest and Haven Street.

Specimens were reported seen at Blackgang in 1928. In 1950 J. Wright discovered a thriving colony near Cranmore, but unfortunately the piece of woodland containing it was felled the following year and *lucina* was not seen there again. In the mid 1950s the butterfly was found in Bullen Wood near Ryde but no longer occurs there. This wood is now overgrown and is used as a dump for waste. In 1960 J. Lobb found *lucina* at Whippingham, but it has not been recorded there again. The exact locality is not known so it may still be present in the area. During the past few years A. H. Greenham and the writer have made a survey of some of the *lucina* localities without success until June 1971, when the writer saw a single worn female at Hamstead.

LYCAENIDAE

Callophrys rubi Linn. (Green Hairstreak)

This inconspicuous butterfly is widespread but never seen locally in quantity. It may be found in such widely differing localities as, rides in Parkhurst Forest, chalk slopes on various downs, heathland on Shanklin Down and by the shore at Compton Bay.

Theda quercus Linn. (Purple Hairstreak)

Present in most wooded areas including; Parkhurst Forest, Firestone Copse, Combley Great Wood, Rowlands Wood, America Wood, Hamstead, Cranmore, Bouldnor, Newtown, Freshwater, Alverstone, Whippingham.

The status of this butterfly seems to have changed little over the years.

Thecla betulae Linn. (Brown Hairstreak)

The Brown Hairstreak has always been a rare species in the Island. In old records are mentioned; Haven Street, Ryde, Quarr, Whippingham and the Undercliff.

Shalfleet is given in the Proceedings of the Isle of Wight Natural History and Archeological Society for 1928. In more recent times J. Wright found larvae commonly at Cranmore in 1950. A single larva was beaten from blackthorn at Cranmore by the writer 8 June 1964, and it was reared by A. H. Greenham to give a female specimen.

Strymonidia w-album (White-letter Hairstreak)

This butterfly was not mentioned at all by Morey, but Fassnidge gave Cornell's note "very rare, one locality only." Cornell's favourite hunting ground was the area around Ventnor and it seems likely that his *w-album* locality was near Ventnor for it was reported there in the late 1940s.

The insect was taken at Whippingham by J. Lobb in 1951 (*Proc. Isle of Wight Nat. Hist. Soc.*, 4: 188) and larvae of *w-album* were found at Cowes by J. Lobb in May 1952. In the years 1964-1966 the butterfly was common at Newtown and presumably it still occurs there.

Plebejus argus Linn. (Silver Studded Blue)

Always a scarce insect on the Island, old records give: west side of Parkhurst Forest (Poole 1902), newport (Owen), Hampstead (Bond).

Cornell recorded the insect occurring in the Ventnor area in 1921, and J. Wright rediscovered it at Hampstead in small numbers in 1947.

Aricia agestis Schiff. (Brown Argus)

This butterfly has declined in numbers during the past ten years. Morey gave as localities; St Boniface Down, Bembridge Down and Brading Down which are on the chalk. Away from the chalk he gave Yaverland, Whitecliff Bay and Haven Street.

At the present time *agestis* occurs rather sparingly at a number of localities along the chalk range including; Culver, Brading, Arreton, Brook, Compton and Freshwater. Away from the chalk it was recorded at Cranmore by J. Wright in 1947 and at Alverstoke in 1955. It also still occurs in the small chalk area near Ventnor.

A fine aberration having all the lunules pale yellow in colour was captured on the chalk by the writer, August 13, 1963, and a similar specimen was captured in the same locality by J. Johnstone in 1968.

Polyommatus icarus Rott. (Common Blue)

Icarus is widespread over the Island but its numbers have become greatly reduced in recent years. The Island specimens

have no special features, and aberrations of any kind are extremely rare. Even the commoner aberrations such as *ab. arcuata* are infrequent.

Lysandra bellargus Rott. (Adonis Blue)

This is another species which has greatly diminished in numbers. It is restricted to the chalk area. Morey gave as localities: Bowcomb Down, Carisbrooke, Mottistone, Freshwater, St Boniface Down and Bembridge Down. Tutt (*Brit. Butts.*, 3: 379, 1908-09) gives most of the above localities and adds Brading. Fassnidge in 1923 added no further information.

In 1921 it was so abundant in the Ventnor area that Cornell was able to report the examination for aberrations of 2000 specimens. J. Wright recorded *bellargus* at Compton in 1926.

The butterfly was still to be found in small numbers at Brading in 1969. On St Boniface and Rew downs near Ventnor it lingered on to about 1960 but has not been noted recently. The Rew Down headquarters was destroyed by refuse tipping. A small colony existed on Westover Down to 1969 when most of its ground was ploughed up for barley growing.

However *bellargus* still occurs in small numbers in several very restricted localities on the chalk range.

In August 1970 a very fine underside aberration was obtained by the writer which, using Leed's nomenclature could be described as *caeca* + *fowleri* + *ante sagittata* + *post albescens*.

Lysandra coridon Poda. (Chalk-hill Blue)

Although Morey stated that this butterfly was common on the chalk and upper greensand it now seems to be restricted to the chalk for breeding grounds. Specimens do tend to wander from breeding areas and may sometimes be encountered in unlikely places. It has suffered great loss in numbers in some of the former best localities such as Brading and Ventnor, where it was once abundant, and attracted collectors searching for aberrations. In both these places it occurs now in very small numbers.

Tutt (*Brit. Butterflies*, 4: 101) gave the localities; near Newport, Freshwater, Carisbrooke, Ventnor, St Boniface Down; Brading Down, Bembridge Down, near Shanklin, Limpet Run, Gurnard Bay. The last three localities are not on the chalk.

At the present time *coridon* occurs, generally in small numbers, in localities along the full length of the chalk range.

Over the years a number of fine aberrations have been captured on the Island. A specimen of *ab. radiata* captured in 1928 was in the Burton collection when it was sold in 1962. J. Johnstone obtained a beautiful specimen of *ab. extrema* in 1967. In 1970 the writer captured a female specimen of *ab. arcuata* which also showed homoeosis on the underside and *inaequalis* on the upperside. Other aberrations which have been caught on the Island over the years include: *discreta*, *glomerata*, *obsolet*, *caeca*, *fowleri* and *albescens*.

A feature of the island *coridon* is the absence of any tendency to blue scaling on the uppersides of females.

Celastrina argiolus Linn. (Holly Blue).

Morey described this butterfly as fairly common and gave a short list of localities. The species might be met with anywhere on the Island as occasional specimens, but there have been local concentrations from time to time. Through the nineteen sixties *argiolus* was a rarity but in 1970 it became evident in many places and in 1971 was still more frequent. At Borthwood in mid-May about twenty of the insects were flying around holly trees in blossom, a larger number than the total number observed in the area during the previous ten years.

Cupido minimus Fuessl. (Small Blue)

This insect occurs in colonies and is very local. Morey's 1909 localities were: Shanklin, Ventnor, Carisbrooke, Totland, Freshwater, Bonchurch and Sandown. Tutt (*Brit. Butterflies*, 3: 146, 1908-09) gave Totland Bay, Niton, Carisbrooke and Freshwater. Of these localities it is now known, with certainty, to occur only at Freshwater.

During the nineteen fifties *minimus* was plentiful on Bradling Down but at the present time its number is greatly diminished. It was found at Compton Bay by J. M. Chalmers-Hunt and was seen there in small numbers by the writer in May 1971. There are probably other localities on the Island where the insect occurs but has so far been overlooked.

Lycaena phlaeas Linn. (Small Copper)

Phlaeas is yet another species which has greatly diminished in numbers in recent years. It may be encountered singly anywhere on the Island but it is no longer to be seen locally in large numbers. There are however favoured localities, where in small numbers it occurs ever year. These include; St Boniface Down, Rew Down, St George's Down, Bouldner and St Helens Duver.

Few aberrations have been recorded for the Island. A broad-margined form captured in 1941 was in the Burton collection when sold in 1962, and a specimen showing homoeosis is mentioned by South (*Butterflies of the British Isles*, p. 153).

PIERIDAE

Pieris brassicae Linn. (Large White)

This species is common in most years. It is not restricted to gardens and cultivated land, but occurs also in open parts of the woods, on downland and along the southern coastline. The wild stock (*Mathiola incana*) grows profusely in places on the sea cliffs and may possibly be used as a foodplant by *brassicae* but as it grows in inaccessible places the possibility has not been explored.

There seems to be no record of any unusual variation.

Pieris rapae Linn. (Small White)

Usually common and in some years abundant. Summer brood specimens may sometimes be seen in large numbers on

the slopes of the chalk downs, presumably attracted from nearby agricultural land by the profusion of flowers.

Specimens of *ab. praeterita* and *ab. nigropuncta* were captured in August 1963.

Pieris napi Linn. (Green-veined White)

Widespread but not abundant anywhere. In Morey's "Guide" it is stated that strongly marked specimens occur at Newchurch and throughout the valley of the Eastern Yar, but such specimens have not been noted in recent years.

Anthocaris cardamines Linn. (Orange Tip)

This butterfly is widespread but less common than formerly for it has suffered severely from the spraying of roadsides and lane verges with hormone weedkillers. For several successive years spraying was carried out in late May or in early June, just when the eggs and young larvae were present on the main foodplant, Hedge Garlic. Fortunately spraying has been much reduced during the past two years.

A specimen having the forewing tips deep yellow in colour rather than orange was bred from a larva found at Alverstone in 1969. A specimen which appeared to be a complete gynandromorph was observed briefly by Mr A. H. Greenham in his garden at Shanklin in 1968 but it eluded capture.

Gonopteryx rhamni Linn. (Brimstone)

Generally common in the wooded areas in most parts of the Island. Eggs and larvae are usually to be found on Alder Buckthorn. Localities are: Alverstone (Borthwood, Firestone Copse, Parkhurst Forest, Cranmore, Newtown.

In "Varieties of British Butterflies" by E. W. Frohawk an aberration having orange suffused forewings is figured. It was captured at Sandown 1873.

Colias croceus Foureroy (Clouded Yellow)

In Morey's "Guide" the years 1859, 1876, 1892 and 1895 are given as good ones for this migrant species. In the years between 1895 and 1908 it was scarce. In more recent times Dr K. Blair observed *croceus* on the Island every year from 1945 to 1952; Mr J. Wright recorded it in 1953, 1954, 1955 and 1957 but not in 1956 or 1958. The author saw specimens every year from 1962 to 1969, but in 1970 and 1971 it was not recorded. The most favoured years were 1947 when it was in great abundance and more recently 1967 when it was common in the autumn. The butterfly is not often observed in spring time but two females were encountered on Brading Down in 1966 on 27th and 29th May respectively.

The pale female from *ab. pallida* was seen in 1967 and in 1969. A specimen of *ab. helice-excessa* captured at Sandown in August 1938 was in the Burton collection, sold 1962.

Colias hyale (Pale Clouded Yellow)

This migrant insect has visited the Island very infre-

quently. Morey's "Guide" states: "Occurred in some numbers in 1900 and has been taken at Sandown (Prout), Newport (Wadham), Parkhurst (Morey), Ventnor (Newman's Butterflies). The most recent record seems to be from Dr Blair for 1945.

HESPERIIDAE

Erynnis tages Linn. (Dingy Skipper)

This species may be found anywhere in the chalk area and in numerous localities away from the chalk. The usual flight period is during May and June but occasionally second brood specimens are seen in August in sheltered localities.

There is variation in ground colour among Island specimens but no major aberrations are known.

Pyrgus malvae Linn. (Grizzled Skipper)

Morey's remark "fairly plentiful" can no longer be applied to the Grizzled Skipper, and it no longer occurs in some of the localities he gave for it. However it does occur in rather small numbers locally, and within the past few years has been observed in the following places: Brading Down, Compton Bay, Freshwater, Hamstead, Cranmore and Whippingham.

Thymelicus sylvestris Poda (Small Skipper)

This butterfly is widely distributed. Morey gave a number of localities but his list could be extended to cover most of the Island. There appears to have been very little fluctuation in numbers over the years.

The Small Skipper in Britain shows little variation and major aberrations are very rare. An extreme aberration having whitish forewings and melanic hindwings was captured by the writer on the chalk 28th August 1968. In the following year in the same locality an albinistic specimen with yellow ground colour was obtained.

Ochlodes venata B. & G. (Large Skipper)

A common insect, and sufficiently widely distributed to make a locality list unnecessary. *Venata* seems to be constant in numbers from year to year. No aberrations are known from the Island.

ADVENTITIOUS SPECIES

A number of species of butterflies have occurred abnormally on the Island. Some of these may be very rare migrants, but some may have occurred through accidental escape, or through deliberate release.

Papilion machaon Linn. (Swallowtail)

Morey gives two records: near Parkhurst Forest, 26th August 1900, meadow west of Parkhurst Forest, 1902

Cornell (Fassnidge List 1923) gives: "two specimens seen Ventnor, no doubt escapes".

Five larvae were found feeding on carrot in a Newport garden in 1946 (*Entomologist* 79: 115).

Aporia crataegi Linn (Black-veined White)

Morey gives the note; "Of great rarity and possibly now extinct. The few captures appear to have all been made in woods near Ryde".

A specimen was captured at Sandown 17th June 1922 by W. G. St. John (*Entomologist* **80**, 127).

Argynnis lathonia Linn. (Queen of Spain Fritillary)

Morey's records are: Sandown 20th October 1865, Ventnor 21st October, 24th October, 4th November (2) 1865. Two reported October 1865 by Owen (*Entomologist* **2**, 340). One of these specimens was in the Burton collection when sold in 1962. Two specimens Ventnor August 1862 (*Entomologist* **6**, 213).

A specimen was captured at Nettlestone 18th September 1943 (*Entomologist* **77**, 9).

Nymphalis antiopa Linn. (Camberwell Beauty)

A specimen in perfect condition captured at Ventnor is in a collection held in Shanklin library and was presented by Mr Weston, but no date is attached.

Morey's old records are: Ventnor and Seaview 1846, Bembridge 1856, fourteen captured in the Island 1872, Shanklin 1876, Totland Bay 1888, one in 1903 and one in 1904.

Vanessa huntera F. (Scarce Painted Lady)

Two specimens have been caught on the Island, one at Luccombe 20th September 1876 *A.E.S. Bulletin* No. **94**, 219) and one at Freshwater 19th August 1956 by Knill-Jones (*Ent. Record* **69**, 74, Plate 1).

Danaus plexippus L. (The Monarch)

The most modern record is of the forewings of a specimen found in a greenhouse at Niton in 1948 (*Ent.* **82**, 153). The old records are: Ventnor 1885, Ventnor 1884 or 85, Shanklin 1887, Shanklin 1895, Culver 1908.

A specimen was seen at Sandown 1947 (*Proc. Isle of Wight Nat. Hist. Soc.* 1947).

Lampides boeticus L (Long-tailed Blue)

There are four records for the Island; Freshwater 1878 (*Entomologist* **12**, 83), Dunnose 1945 (1946 *Journal Soc. Brit. Ent.* **3**, 9), Freshwater, captured by Knill-Jones 1949 (*Entomologist*, **86**), Luccombe, captured by Lobb 30th August 1952 (*Proc. Isle of Wight Nat. Hist. Soc.* 1953).

Thymelicus actaeon Rott. (Lulworth Skipper)

The few records of this butterfly are: A pair at Sandown (*Proc. Isle of Wight Nat. Hist. Soc.* 1929, p. 81), one at Sandown 1921 (*Entomologist* 1953, p. 56), one captured by Knill-Jones at Freshwater 1949 (*Entomologist*, **86**).

A Contribution to the knowledge of *Phytonomus meles* F. (Col., Curculionidae) in Britain

By A. A. ALLEN, B.Sc., A.R.C.S.

Regarding this weevil—always very scarce with us, as far as records testify—Canon Fowler's statement that "the species appears to be very imperfectly known" (1891: 236) remains, for this country, virtually as true to-day as when it was written. As usual in such cases, it was (like the still rarer *P. elongatus* Payk.) omitted by the late Dr Joy from his *Practical Handbook of British Beetles* (1932)—though oddly enough he included *P. arundinis* Payk., the rarest of all and perhaps long extinct. In reality, however, *P. meles* is quite distinctive, and not difficult to recognise once its appearance is familiar. It will be well, therefore, to set forth its characters more fully than hitherto for the benefit of coleopterists, before bringing the records as far as possible up to date. The former may be most conveniently done by tabular comparison with that species to which, in our fauna, it comes nearest and which sometimes does duty for it in collections—namely the rather common *P. plantaginis* Deg.

(Pronotum very obviously transverse, strongly dilated at sides and strongly contracted to base, unlike all other British spp.; elytra with scales bifurcate, and with raised setae mostly towards apex; L. 4-5 mm.)

meles

Elytra on alternate intervals towards sides and apex more or less lineated, or tessellated with small light spots, but without large dark patches or other conspicuous marks.

Head between eyes narrow, much less than greatest diameter of eye seen from above.

Rostrum in ♂ as long as pronotum, in ♀ longer; thinly haired, very shiny, with at least traces of a lateral furrow or fine ridges (may be obscured by the hairs).

Antennae with scape longer, apical thickening smaller and less abrupt; segment I of funicle in ♂ clearly longer than 2 (in ♀ less so).

Pronotum widest a little behind middle, sides scarcely sinuate before hind angles

plantaginis

Elytra with large dark patches at sides behind and small ones at base, but if immature, uniformly pale rufous or ochreous-brown without distinct tessellation or lineation.

Head between eyes wider, little less than greatest diameter of eye seen from above.

Rostrum about $\frac{1}{4}$ shorter than pronotum alone (♂ and ♀), thickly haired and thus duller, with no trace of a lateral furrow or ridges.

Antennae with scape shorter (more so in ♀), apical thickening larger and more abrupt; segment I of funicle subequal in length to 2.

Pronotum widest a little, or plainly, before middle, sides sinuate just before hind angles which thus tend to be more marked.

which are very obtuse or effaced.

Scales on elytra divided nearly to their bases like an inverted V, the arms hair-like, plainly diverging; more evenly but less densely covering the surface; those on the pronotal disc simple, fine, and hair-like.

Setae of elytra weaker, less outstanding, less numerous.

Scales on elytra broader, the two points only as long as the body of the scale, scarcely diverging (but when immature, scales appear hair-like throughout), thickly covering the pale areas; those on pronotum largely as above, but the broader ones of the mid-line short-pointed.

Setae of elytra stronger, more outstanding, more numerous.

The different form of the scales in the two species, as regards both pronotum and elytra, is sufficient to separate them decisively under a moderate magnification—e.g., about $\times 40-50$. (Scale characters are important in this genus; Reitter (p. 101), Hoffmann (p. 572), and Hansen (p. 108) figure the various types). A warning, however, is necessary here. Immaturely coloured examples of *plantaginis*—far from uncommon—not only lack the pattern characteristic of mature individuals but also have the scales undeveloped, appearing simple and hair-like; and on both features thus somewhat more resemble *meles*, for which they have been mistaken. Careful attention to the various characters, however, will prevent such errors.

The colour-tone of the scales varies in both species; in *plantaginis* it can be decidedly green, though more often ashy-grey to brown. My pair of *meles* from Surrey both have a strong coppery cast to the elytral scales, and the pronotal scale-hairs are iridescent and present a beautiful crimson glow when the light strikes them at a certain angle. In the Harwood specimen, however, a grey tint prevails. Fowler's "greyish or yellowish-brown" sufficiently describes the general impression.

I have not examined the genitalia of *P. meles*, which may well be somewhat characteristic, but they should scarcely ever be needed for identification.

Most of what Fowler writes concerning this species (pp. 231, 236) appears correct, except for his statement (p. 236) "second joint of funiculus not much longer than third joint" which may be rectified by deleting the word "not". He describes the rostrum as "nearly straight", but this rather overstates the case, it being merely a little less noticeably curved than in the allied species. What is far more puzzling, Hoffmann (p. 583)¹ ascribes the longer rostrum to the male, remarking (justly) that this is the exact opposite of the usual condition in the family. I would certainly agree as to the differing rostral lengths; yet on the other hand, from my material, I cannot agree that Hoffmann has allotted them to the right sexes, and, since he has correctly recognised the latter, can

only conclude that his attribution as above is erroneous—especially as it is not supported by other authors.

Hansen (1965: III) figures the difference in pronotal shape between *meles* and *plantaginis*, but that relating to the base is not always marked in British specimens of the latter.

¹Hoffman (l.c.) reverts to the name *Hypera* for the genus, formerly in wide use and in all British literature up to Joy (1932); giving seemingly valid reasons, with which, however, I am not here concerned. Further, he employs none of the almost unused names given for some of the species by Kloet & Hincks (1945: 214), and which are not accepted on the Continent. His names for the British species are as given by Joy (1932) except *zoilus* Scop. (1763) for the large species long known as *punctatus* F. (*austriacus* Schrk. in Kloet & Hincks). However, the two names *posticus* Gyll. and *venustus* F., as used by the last-named, must probably be adopted; though Hansen, writing 11 years later, still uses the generally accepted *variabilis* Hbst. and *trilineatus* Marsh. respectively for them, his nomenclature being wholly identical with Joy's for our species. I am strongly of the opinion that we should adopt, here and elsewhere, those names which a consensus of Continental usage—as far as it may be had—would dictate.

The foodplants of *P. meles* are typical of its genus: species of *Trifolium* (clover), *Medicago* (lucerne, medick), and *Lotus* (trefoil) are cited on the Continent. Despite its name, the same would seem to be broadly true of *P. plantaginis* (cf. Hansen, p. 119).

The only² published records of *Phytonomus meles* in Britain that I have seen are given by Fowler (1891: 236):—"Mickle-

²The *Hypera trifolii* Hbst. recorded by Stephens (Ill. Brit. Ent., 4: 99) as "not infrequent within the metropolitan district; also found in Norfolk and Suffolk" may indeed—as some points in his description suggest—have been *P. meles*, with which Herbst's insect is believed to be synonymous.

ham (Power); received from Ross years ago (S. Stevens); Selby, near York, by sweeping a river bank in September (W. C. Hey)"; by Donisthorpe (in Fowler & Donisthorpe, 1913: 308) who adds "Yarmouth and Foxley Wood (Edwards)"—both localities in Norfolk—; and by Bedwell (1909: 164) who reports his capture of "what I am told is probably *Hypera meles* F." by sweeping on the chalk downs near his house at Coulsdon, Surrey, early in July 1908. Bedwell's specimen is most likely genuine, though confirmation is desirable; its identity was probably suggested by E. A. Newbery. I have inspected the material standing over the name *meles* in the Power collection and found that the two examples from Mickleham, Surrey (see above) are no more than the deceptive pale (doubtless immature) form of *plantaginis* already referred to as liable to cause confusion; they have now been separated and labelled as such. Power's Surrey record of *meles* must therefore be deleted. The other three are old specimens with various labels but no locality, and are true *meles*.

There is in the Hope Dept., Oxford, a specimen (which I have examined) taken by P. Harwood at Wicken Fen, Cambs. (15.v.42). According to Donisthorpe (MS locality list), T. Hudson Beare swept a weevil of this genus from a patch of lucerne

in flower on the way to Wicken Fen from the village (18.ix.22) which he (Beare) made out to be the present species, but Donisthorpe told me he always thought it was only *P. suspiciosus* (i.e. *pedestris* Payk.). In view of Harwood's specimen, however, that opinion is perhaps questionable. Donisthorpe (MS list) adds for *meles*:—"By sweeping in Stubby Copse, New Forest, June 17 (J. J. Walker); several on Crymlyn Burrows (Swansea List)". Concerning Edwards's Yarmouth example he notes that it occurred under *Ononis* in August.

Finally I can add two further records for Surrey—the latest British captures known to me. My interest in the species was first aroused on finding an unfamiliar-looking *Phytonomus*, set aside from the rest of the genus, in the late H. Dinnage's collection which I had acquired, and which proved to be a male *P. meles* in very fair order; it was labelled "Guildford 5.46". Later I had the good fortune to take a specimen at Oxshott Heath by sweeping heather (17.ix.58)—a female in fine condition. Not far off was a moister spot where grew red clover and large birdsfoot-trefoil, from which it seems that the beetle may have strayed, but all attempts to obtain further specimens were fruitless.

Whilst it is true that (as already pointed out) forms of the variable *P. plantaginis* are to be found standing as *P. meles* in collections, the reverse mistake is just as likely to occur, since many collectors name their insects from Joy's book and *meles* would there at once key out to *plantaginis* with at most a slight doubt. This renders it likely that some genuine captures of the former have escaped the records — especially perhaps as the species is common in (e.g.) northern France and widespread in Denmark.

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63 Blackheath Park, London, S.E.3. 8.ii.72.

Notes and Observations

CURIOUS BEHAVIOUR OF LARVA OF *ACHERONTIA ATROPOS* L.—Mr O'Heffernan persists in describing the normal behaviour of the brown larval form of *Acherontia atropos* L. as curious (*Ent. Rec.*, **83**: 356-7). On no fewer than two occasions, commenting on his similar records, I have pointed out that it is completely normal for this form to feed at night and hide by day (1967 *Ent. Rec.*, **79**: 24 and 1968 *Ent. Rec.*, **80**: 60 and 212).—D. G. SEVASTOPULO, F.R.E.S., Mombasa, 18.ii.1972.

COLEOPHORA SYLVATICELLA WOOD (LEP. COLEOPHORIDAE) IN KENT.—At Ellenden Wood near Whitstable on July 10, 1971, I collected into a bag some seed heads of *Luzula sylvatica*, and on looking into the bag a few days later, noted a few small cases of *C. sylvaticella* the larvae of which were crawling about on the cloth sides. I revisited the locality of September 16, and collected some more cases which were then fully formed.

This species has only once before been reported from Kent. In early June 1935, H. W. Daltry took a single male imago in Blean Woods (cf *Entomologist*, **69**: 114).—J. M. CHALMERS-HUNT, 7.iii.1972.

CLOSSIANA SELENE (DENIS & SCHIFFERMULLER) SECOND BROOD SPECIMENS.—May I add the following notes: Second brood specimens of this fine species are to be found in the county of Cornwall. I suspect this to be a gene controlled character as I have seen them freely, when on holiday there in August, during past seasons. Dr F. H. N. Smith stated in 1965 (in litt.) that *A. selene* is quite common in most suitable spots and is partly double brooded.—J. H. PAYNE, 10.ii.1972.

AN EARLY PYRALE — On the 14th February 1972 I was interested to see flying against the inside of a window at the Bishop Stopford School, Enfield, a fresh specimen of the small magpie moth (*Eurrhynx hortulata* (L.)).

I tend to think of the Pyrales as a group most strictly confined to the summer months and the normal time of emergence of this species is June to July.

The Editor has drawn my attention to a note by Dr C. G. M. de Worms (*Ent. Record* **81**:90, 1970) which shows that, although unusual, this is not by any means unknown for this species.

DECHTIRIA TURBIDELLA (ZELL) — I would like to support Col. Emmet in his observations that *D. turbidella* feeds on *Populus canescens* and not *Populus alb.* Last autumn, just to the south of Epping Forest, I was looking at a small tree of one of these species, and found the mines plentifully. That tree was found to be *P. canescens*. A few yards away was a sapling of *P. alba* and this was not frequented by one mine of this species. This seemed conclusive evidence that *turbidella*

feeds only on *P. canescens*. I believe that this may also constitute a new country record.—REV. D. J. L. AGASSIZ, 1.iii.1972

LAMPROPTERYX OTREGIATA METC (LEP: GEOMETRIDAE)—On 2nd September 1971, a single female specimen of *Lampropteryx otregiata* Metc appeared at a lighted window of my house in Ledbury, Herefordshire. This is the first record for this species in this county, and appeared at first sight to be outside the normal distribution range of this predominantly south-westerly species. It is best known from Cornwall, Devon and Somerset. Its range extends to the New Forest, Hampshire, in the south, while in Wales the species is most frequently encountered in the western seaboard border, and extending as far north as Caernarvonshire. I was interested in J. M. Chalmers-Hunt's record (Ent. Rec., **83**, 11) of Dr N. Horton's only Breconshire specimen captured on 22/6/1971. The only other record that I can trace for this area is in Gloucestershire, where Mr J. Newton has observed this species in the Forest of Dean, initially in 1963, and also from 1965-1967 inclusive.

My specimen was in fair condition and proved to be a fertile female as ova were subsequently laid. The newly hatched larvae fed well on *Galium saxatile* (Heath Bedstraw) and *Galium palustre* (Marsh Bedstraw). At no stage during larval growth could they be induced to feed on other Bedstraws i.e. *G. verum* (Lady's Bedstraw), *G. mollugo* (Hedge Bedstraw), or *G. odoratum* (Sweet Woodruff). It is however, known to feed on *Gadium aparine* (Goose Grass) in captivity, although I feel that this is unlikely to be a natural foodplant for this species.—Dr M. W. HARPER, Cotham, Upperfields, Ledbury, Herefordshire. 17.ii.1972.

Current Literature

Fundamentals of Applied Entomology, Second Edition, edited by Robert E. Pfadt. x+693pp. Collier MacMillan, £6.75.

The preface of the first edition is repeated, and the scope of the book explained, namely that the amount of available data is so great that the authors have attempted to write text based on principles. The first chapter, headed Insects and Man is by the Editor and gives an account of this relationship from biblical days with an outline of entomological history from Colonial America to the present day, with accounts of several American entomologists associated with applied entomology. There follows a short account of entomology in Canada, and another of entomological societies. There is also an account of American laws concerning the manufacture sale and use of insecticides. The final section, entitled "Why this book?" mentions the principles followed by the Editor and authors, pointing out that only four or five of the insects

infesting a host are mentioned, but that the student can find out, with the assistance of his teacher, the required details of other pests, to his personal edification. Six selected references are given for further reading on the subjects of this chapter. This principle is followed at the end of each chapter.

Chapter 2, by **Robert F. Harwood**, is entitled *Insect Structure and Function*, and is well illustrated by figures, both line drawings and photographs. 10 references are given. Chapter 3, by the same author, deals with insect growth, in the same style, with 3 references.

Chapter 4, by **Carl Johansen**, the *Classification of Insects and their Relatives* includes a key to the major economic families of Acrina, the features mentioned being illustrated with each step. There follows a table of insect orders illustrated with drawing of a representative species for each order, with details of common name, matamorphosis, wings, mouth parts, distinctive features, habitat and agricultural importance. Table 3 tabulates the characteristics of the immature insect of agricultural importance orders. There are keys to the orders followed by keys to the major families in each order, rendered easier by clear line drawings to illustrate them. There are 17 references.

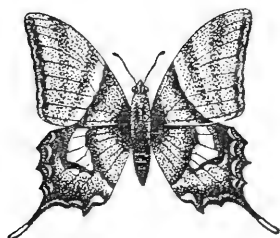
Chapter 5, by **H. C. Chiang**, *Insects and their Environment*, deals with the subject from many angles, and there are 20 references. *Principles of Insect Control* is the subject of Chapter 6, by **Carl Johnansen**, and is also very thorough in dealing with all aspects, with 35 references. Chapter 7 by **W. Don Fronk** deals with Chemical control with 13 references and Chapter 8 by the same author is on equipment for insecticide application, with 10 references.

There follow chapters on the insect pests of various types of host: *Small Grains* by the Editor, *Corn* by **C. C. Burkhardt**, *Legumes* by **Austin Haws** and **C. C. Burkhardt**, *Cotton* by the Editor, *Vegetable Crops* by **W. Don Fronk**, *Tree Fruits* by **Carl Johansen**, *Small Fruits* also by this author, *Floricultural Crops* by **John A. Naegle**, *Stored Grain* by **Donald A. Wilbur**, *Household Insects* by **John V. Osmun**, *Livestock* by the Editor, *Poultry* by **Deane P. Purman**, and *Insects of Medical Importance* by **Wm. Rogoff**.

All these chapters are well illustrated by photographs and line drawings, which will be of great assistance to the student.

There is an appendix of common and scientific names, a glossary of technical terms used in the text, and an index. The printing and cloth board binding, also the paper are excellent.

While this book deals mainly with the subjects from the American angle, the fact that it deals mainly with principles makes it useful to students in all countries, giving them, as the editor pointed out in the beginning, the added instruction gained by adapting these principles to their own particular problems. — S.N.A.J.



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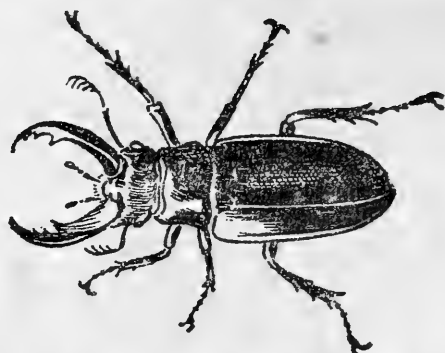
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Observations on British Butterflies in 1971

By A. P. GAINSFORD, F.R.E.S.

A cold and persistent wind from the south-east kept the temperature down when the first bright days of March brought *Aglais urticae* L. and *Nymphalis io* L. out of their winter quarters, the former seen first at Looe in Cornwall on the 23rd and the latter along the cliff path just west of Polperro on the 31st. Despite haziness caused by a damp coast mist the powerful *N. io* sensed the warmth of the sun's penetration and both sexes were exercising freely and performing frequent courtship flights high into the air. Beneath the partial shelter of a stretch of overhanging Ivy I came across three freshly emerged male *Pararge aegeria* L., and these were well ahead of schedule.

The 10th of April dawned bright and clear and by noon the brilliant sunshine had encouraged scores of *Gonepteryx rhamni* L. to venture forth from their long sleep amongst the bushes and fly restlessly over the Gorse and Dandelions up and down the steep south-facing slope of the Walkham Valley near Tavistock in Devon where not many years ago a lofty stone viaduct used to carry the Southern Railway main line high across the river. The sulphur yellow butterflies and flowers were fresh and gay beneath a deep blue sky flecked with small white cumulus clouds. These perfect few hours of an early Spring were short-lived however and the sun did not shine again until the 14th.

Celastrina argiolus L. had been plentiful the previous year after a long period of comparative scarceness and I decided to pay a visit to my favourite locality for this delicate little butterfly on an exposed and windswept cliff near Downton in Cornwall. A narrow footpath winds up to the top through Blackthorn and Ivy dwarfed and twisted by the blast of the prevailing south-west winds and some gentle beating of a few likely-looking bushes soon disturbed several males. All told I saw twenty-two males and three females between 10 a.m. and midday when the sun was finally obscured by dense cloud and the breeze strengthened to gale-force gusts. Subsequently *C. argiolus* became quite common in many places in both the Spring and Summer broods and we are indeed fortunate to be able to enjoy such a dramatic increase in numbers of one of our prettiest species in this age of pollution and decline.

On the morning of the 15th April a lone *Pieris brassicae* L. drifted into my garden in Tavistock and a few days of unusually warm and sunny weather resulted in the early appearance of several *Pieris rapae* L. near Plympton and Plym Bridge and one *Pieris napi* L. at Tavistock on the 19th. That same afternoon I saw a single *Lycaena phlaeas* L. at Wembury Point near Plymouth.

Several *Polygonia c-album* L. were out from hibernation in a sheltered area beneath the trees at Genofen settling on the dead leaves to sun themselves as early as the 10th April.

The second half of April had become generally sunny with

the temperature rising quite rapidly as the cold wind died down. Spring flowers in the banks bordering lanes and along woodland tracks were prolific and the Primroses on the hill-sides, the Bluebells in the woods and the Violets along the coastal paths were the largest I can remember having seen.

Antocharis cardamines L. began to emerge on May Day and I noticed three in a marshy field near Sampford Spiney on the southern fringe of Dartmoor. Later in the month they were plentiful at Grenofen and elsewhere and there seemed to be considerably more females on the wing than usual. *Pararge megera* L. used to be common at the coast near Wembury but numbers were well down this year. The earliest I saw were two males on the 3rd of May near the top of the footpath down to the Point. They seemed to be more plentiful in the second brood on the southern slopes of Dartmoor, and I took a nice female aberration with the space between the central transverse lines on the fore wings blackish. Also on the 3rd a few *Callophrys rubi* L. were darting about on the low, rough cliff near Heybrook Bay. A week later it was out early in its very different environment of wooded river valleys on Dartmoor.

In this spell of unusually warm weather for early May I was not surprised to find *Erynnis tages* L. on a cliff edge footpath near Torquay on the 4th. It was so fine and bright, with the Kidney Vetch already past its best, that I half expected to see *Cupido minimus* F. on the rocky precipice which harbours one of the very few colonies left in Devon, but this was somewhat optimistic. The first I saw was on the 13th May, and I waited patiently for over three hours to spot only two. Another visit to the same locality on the 17th showed no real increase, but by this time *Polyommatus icarus* R. was well out with plenty of fresh males and a few females on the wing.

A brief stroll along the cliff path at Polperro on the 11th May in warm sunshine after two days of damp mists resulted in seeing *C. argiolus* in abundance, with many feeding on the nectar in the bluebells and several pairs mating on the Ivy bushes.

Pyrgus malvae L. was later than might have been expected, but this was no doubt due to the cold mists which had enveloped the coastal areas and kept the temperature down. I had been watching a tiny habitat on rough, open ground near Wembury Point no more than sixty yards long by fifteen or so wide, and it did not appear here until the 12th of May. The species is still widespread but by no means common and it is interesting to note that a high percentage of specimens vary from partial to extreme ab. *taras* in many of our Devon colonies.

Returning from Torquay via Newton Abbot on the 17th of May I estimated that *Argynnis euphrosyne* L. would be emerging and stopped at the new Forestry plantation on the west side of Stover Lake near the village of Teigngrace. In fact it was fully out and exceedingly abundant, jostling for space on almost every blossom of the plentiful Bugle. It was evident from the worn condition of quite a number of specimens that

they had been on the wing for at least a week to ten days. I have never seen the species quite so common. Two days later I returned to see some very fine and large individuals, both lightly and heavily marked with black, and flying among them a few *P. malvae* from the old ab. *taras* colony in the nearby remains of Great Plantation. Closer behind its near relative than is customary *Argynnis selene* S. appeared on the 20th of May in the close confines of its Walkham Valley habitat near Sampford Spiney. The weather continued hot and sunny and the butterfly was about a fortnight earlier than average. Numbers in this small colony were later found to be low and the females did not show themselves until the end of the month. The species is widespread here in Devon and Cornwall, but never really common in any one place. Also on the 20th investigation of a small field beside the River Tavy, near the village of Marytavy, was rewarded with the sight of several *Euphydryas aurinia* R. Their movements are swifter than some authors describe and when they attack each other they are capable of darting off in any direction with extreme alacrity. The very much lazier females began to emerge before the month was out. The variation in pattern and colour of this butterfly is extensive and our Devon specimens show a marked predominance of brick-red markings. The day was noteworthy for yet another insect, *Coenonympha pamphilus* L., of which I saw my first for the season.

On the 28th of May, which coincided with Half-Term, I took my wife and two younger sons to Ventnor in the Isle of Wight, and in the late afternoon there were sufficient sunny intervals to stir *Melitaea cinxia* L. of both sexes at St Catherine's Point, Niton. The next day I formed the impression that they were not as plentiful as they had been for the last few years, but as the weather was patchy and my time short this may or may not have been a fair assessment. Despite very little sunshine and a cold wind on the 29th there were strong colonies of *Aricia agestis* S., *P. icarus*, *C. pamphilus* and *L. phlaeas* flying at the foot of St Boniface Down.

I spent the 2nd of June on Hod Hill near Blandford Forum, and though the sunshine was continuous a fresh breeze prevented it from being too hot. My favourite blue butterfly, *Lysandra bellargus* R., was on the wing — but very scarce indeed. During the morning I met Major General C. G. Lipscomb and like me he deplored the scarcity of this lovely species. He told me of the difficulty the Dorset Trust had in controlling collecting within the reserved areas and mentioned that, as a Warden, he had already encountered and dealt with a North Country collector whom he had found stuffing everything he could catch into a killing bottle with complete disregard for the many Trust notices. *P. icarus* was abundant and the males so large and bright that I found myself constantly mistaking them for *bellargus*. The old *E. aurinia* colony on the west side of the hill was badly down in numbers, and all that I saw of any real interest was a nice *L. phlaeas* female ab. *obsoleta* and a *L. bellargus* male ab. *striata*. Only one solitary *C. minimus* showed

up. The following afternoon a quick trip to Westbury White Horse Hill in Wiltshire was no more enlightening. *L. bellargus* and *C. minimus* were very low and *Hamearis lucina* L. already worn.

It remained fine and warm for several days and must now be high time this early Summer for the trek into the woods and thence up an overgrown lateral valley commencing from a bend in the Tamar to a tiny hump of isolated heathland where some Cow-Wheat supports a colony of *Melitaea athalia* R. This is a Cornish Trust Reserve and fortunately in some ways it is extremely difficult to find. It was as yet only the 5th of June but both sexes were out with a few indicating by their condition that they had already enjoyed a week or so of their short lives. I was alarmed to find that nearly three-quarters of the habitat had recently been burnt off and only a few pathetic remnants of the formerly prolific food-plant remained. I estimated that the butterflies were down in numbers by about five-sixths. A discouraging situation for another of our critical species. We have, however, at least one other and larger colony in Devon not far from Brent Tor and on the 7th of June, after the considerable walk involved, I was treated to the splendid sight of *M. athalia* in abundance. This habitat is a really good one and after some persuasion I am advised that steps will be taken to protect it, with the co-operation of the Forestry Commission, while the opportunity remains. Flying with *M. athalia* were *A. euphrosyne*, *A. selene*, *P. malvae* and *P. aegeria*, some of the latter beginning to approach the true *aegeria*. Just before leaving in the late afternoon I saw a beautifully fresh *A. selene* male aberration with confluent hind-wing spots and a yard or two away, partially hidden by some long grasses, one of the largest Adders I have had the good fortune not to tread upon.

I noticed the first *Ochlodes venata* B. & G. on the 5th and, as always, it subsequently became common almost everywhere.

The big Fritillaries have always held a special fascination for me, and this year their woodland habitat on the left bank of the River Walkham near Grenofen, untouched for a year or two, looked more like it used to be way back in the 1930's when I was a schoolboy in Tavistock. June had not lived up to its reputation and had turned dull and cold with only a few sunny periods from time to time. These butterflies do not appear in overcast conditions and when I went down to this favoured spot on the morning of the 9th of June I was surprised to see a perfect and freshly emerged male *Argynnis aglaia* L. during a very brief glimpse of watery sunshine. Two more wet days followed but the 12th showed a welcome improvement and half a dozen or so of these splendid creatures were beating up and down the fringe of the wood settling occasionally to imbibe the nectar from tall Field Thistles. An unusual sight was a short but spirited tussle in mid-air between one of them and an elderly male *G. rhamni* still bravely on the wing.

A lone *Maniola jurtina* L. flopped about in the grass at Grenofen on the 9th of June.

Some very heavy rain then ensued and only a few weak gleams of sunshine were able to break through the almost impenetrable cloud until the end of the third week of the month. There is no doubt that *Argynnis adippe* L. would have appeared sooner had the weather been better, but as it was I did not see the first butterfly until the 25th. From year to year one cannot tell which of the two species is going to be most abundant. Last year *A. aglaia* was really common once again and very dark and heavily bronzed females similar to the Hebridean form were to be seen in numbers amongst them scattered about in the grassy strip between the woods and the river. This season they were once again extremely scarce with *A. adippe* in greater strength. With the heat of true Summer beginning to break through at last *Argynnis paphia* L. began to emerge on the 4th of July and soon the glade was alive with these three magnificent relatives utterly dwarfing the little *A. selene* which had temporarily ceased to come out due to the weather and was consequently now still fresh and in excellent numbers.

Despite what has been written by some well-known authors we have had *Limenitis camilla* L. in Devon for many years and there are several thriving colonies as far west as Bovey Tracey, Stover and the Yarner Wood Nature Reserve. This year it was late and did not show itself until the 5th of July. Not far away on Bovey Heath *Plebejus argus* L. was flying, but the females had not yet begun to join the males.

By the 5th of July the weather was set fair and it was high time to drive to the rugged north coast of Devon and Cornwall between Hartland and Bude to look for that most elusive and fast disappearing butterfly, *Maculinea arion* L. One can climb down the steep, overgrown and often precipitous sides of many very similar valleys to the streams at their depths which cascade into the sea over the rocky shores, and it is only the constant if faint hope of seeing a single insect that staves off exhaustion until four p.m. after which time it no longer flies. Despite its apparent ability to hang on in very small numbers it is an infuriatingly fastidious creature, flying only for a few hours each day and requiring ideal conditions of sun and wind. Unless one may have the greatest good fortune to see a stray, despite plenty of Wild Thyme and seemingly ideal surroundings, there is nothing for it but to visit the two so-called "secret" habitats in the National Trust which are patrolled throughout the flight season by active Wardens to ensure that not one single specimen is taken. In three whole days of well nigh perfect conditions, the 5th, 7th and 9th, I had only six sightings, but I cannot say definitely that this figure is accurate as the same butterfly might have passed by more than once. The areas in which they fly are extremely confined and they have a habit of disappearing before their true identity can be confirmed. I was fortunate in securing good photographs of a female with her wings more than half opened and several undersides. A well-known local entomologist stumbled upon

a pair in cop. shortly after I had left the site and succeeded in obtaining a number of shots of this very lucky fortuity. It would be an understatement to say that this butterfly is in danger of extinction here. As things are it would indeed be a miracle if it were to survive. A great deal more has to be done to save it than has so far been put into effect, and so much is involved, commencing with the rehabilitation of the ant-hosts having first determined once and for all which species are vital, that I cannot now believe that it is not already too late. Adverse weather conditions during the month of July next year could be the end, and in my opinion this would be our greatest loss since *Lycaena dispar dispar* H. in 1848.

The first *Melanargia galathea* L. were noticed at Lydford in Devon on the 28th of June, and they became common in many places especially on the rough south-facing slopes of the north Devon and Cornish coasts. Some *Aphantopus hyperanthus* L. were in evidence in North Devon on the 2nd of July, and *Thymelicus sylvestris* P. darted about amongst a few *Eumenis semele* L. on the stony tracks and in the moorland grass beside them.

Maniola tithonus L. ventured forth about the 8th of July and very soon became abundant wherever there was sufficient Bramble to support a colony.

July continued sunny and hot and so many butterflies were on the wing that for the second season running I left too late my trip to a tiny, secluded habitat near Dorchester where *Strymonidea w-album* K. is firmly established. On the late afternoon of the 16th the sun was already sinking, but several large Bramble bushes were still bathed in its rays between long shadows cast by several old Wych Elms nearby and upon the blossoms sat scores of these rather drab little butterflies. When disturbed some would fly swiftly up into the trees while others returned almost at once at could even be picked up between finger and thumb. They were all more or less ragged and torn and had obviously been out for a week or more. This was the first day of our family Summer Holiday and we drove on to our destination at Studland Bay whence I had planned to make a few fairly local expeditions while my wife and three sons enjoyed the swimming and sunbathing. On the 17th I drove over to Durlston Head at Swanage and walked down into Lighthouse Valley. It was full of *Thymelicus acteon* R. and *T. sylvestris* together with several *C. minimus* which were examples of a second brood of this species. Up on Ballard Down, the other side of Swanage, were *A. aglaia*, *M. galathea* and *M. tithonus* in profusion, *aglaia* careering about tirelessly and pausing only occasionally on the thistles. I always find it something of a relief to get out into the wide open spaces after being robbed of my blood by the pestilential insect Draculas of the woods and left with painful lumps on face, neck and hands which irritate for weeks afterwards.

On the 19th I set off early for Brockenhurst and a day in the New Forest. *Apatura iris* L. did not condescend to meet me at

Whiteparish Woods en route, but as I spent less than half a hour at this well-known place it would have been something of a coincidence. I wanted to see *A. paphia* ab. *valezina*, and was not disappointed. It showed up about mid-morning flying along a ride at Ladycross and I saw a second at Park Hill, near Lyndhurst, during the afternoon. *A. paphia* and *L. camilla* were abundant and my day would have been made if ab. *nigrina* had chanced to cross my path, but it did not.

A return to Hod Hill on the 23rd July was rewarded by *Lysandra coridon* P. well out and plentiful despite cloudy conditions with very little sunshine. Several quite striking underside aberrations were seen.

Having returned home I was glad to be able to confirm on the 30th that my favourite colony of *E. semele* on the heather-clad moorland around an old tin mine near St Anne's Chapel, Gunnislake, was thriving, and many large and very fine females were among the healthy population.

I had arranged to meet my friend Mr A. D. A. Russwurm and his co-collector Mr. H. G. M. Middleton in Westmorland on the 3rd of August for a couple of days to study *Erebia aethiops* E. I left Tavistock early that morning in heavy rain and with decidedly poor weather prospects ahead to arrive in the afternoon having driven the 330 odd miles in a great deal less time than I had anticipated, the motorway for more than two-thirds of the distance being the reason for my decidedly excessive speed. It was still raining and there was nothing for it but to hope for an improvement the next morning. However it dawned wet, but by 10 a.m. there was a slowly increasing brightness in the sky which encouraged some reconnaissance. By 10.45 a.m. the rain had stopped and — once again contrary to what has been written — well before the sun finally succeeded in breaking through *E. aethiops* had begun to fly. The place selected supports a very extensive colony and I set about taking my short series without need for too much concern over its welfare. The female is dimorphic, the two distinctly different grey-blue and ochreous undersides occurring in about equal numbers. Within less than an hour torrential rain set in again, but the sky cleared by early afternoon and I was able to see the wonderful setting of this place and the magnificent view across the estuary northwards to the Lake District. An interesting race of *A. adippe* also thrives here.

My last expedition of the season before being smitten by a somewhat late-in-life attack of Measles was to Dorking in Surrey on the 13th of August to hunt for *Hesperia comma* L., and again rain accompanied this time by gale force winds hampered my chances of success. However, the rain gave place to bright sunshine by mid-morning on the 14th, though the wind continued unabated. The most diligent and energetic searching on Box and Lodge Hills resulted in seeing no more than seven specimens all day. None could be found on the old Pilgrims' Way and none at Pepper Box Hill near Whiteparish on the way home the next day.

The Autumn butterflies during an almost continuously fine and warm September were prolific in some species and uncommonly scarce in others. By the 20th *Vanessa atalanta* L. was in good numbers, especially along the coast between Bovisand and Heybrook Bay, and *Aglais urticae* L. was abundant everywhere. Also in this locality the later brooded *L. phlaeas* were now very plentiful and I took a nice female ab. *discoelongata*. One large and fresh female *Vanessa cardui* L. visited my garden on the 16th, and this was one of no more than half a dozen seen throughout the whole summer. I hunted in vain for *Colias Croceus* F. 1969 was a good "Clouded Yellow Season" and I counted over three hundred in October when it became increasingly abundant along the coast near Plymouth right up until the 21st when the weather broke and it disappeared at once. In September and October, 1970, I saw only seven. Despite the weather remaining dry and warm until early November the season had closed abruptly and in some respects disappointingly.

Of the species I was unable to observe due either to the distances involved or the inability to get away at the right time I have heard encouraging reports, and these include *Thymelicus lineola* O. near Salisbury, *Leptidea sinapis* L. near Exeter, *Strymonidia pruni* L. and *Thecla betulae* L. near Oxford to mention some, but I would welcome any information upon the localities and status of *Carterocephalus palaemon* P. and *Coenonympha tullia* in England.

Mulberry House, Whitchurch Road, Tavistock, Devon.

Regarding *galathea*

By CHARLES F. COWAN

I was stationed at extra cover and my best friend was at square leg. It was my last game of cricket at school at Newnham, on the outside of the horse-shoe bend of the river Severn below and west of Gloucester. Suddenly, as a ball was about to be bowled, a butterfly passed diagonally across the pitch and I shouted "Marbled White"! The game resumed, but I was later given a two-fold reprimand, for inattention and for spreading false reports.

Now that was in July 1926; *Melanargia galathea* L. had "never" been known in the neighbourhood, and I had never seen one before. Yet my friend supported me, and I was vindicated (in part, at least) in the following year when I heard that the species was common round that field. It was still there in 1939, and it is shown as still in the same "square" (32/61) in 1960, in the fascinating *Provisional Atlas* published in 1970. But, sadly, it is not shown in 1971 by A. D. R. Brown (vol. 83: p. 107).

Why should such changes occur? Is *galathea* vulnerable? On what does it feed, and what are its ecological requirements? Two grasses are generally listed as its natural food;

Phleum pratense and *Dactylis glomerata*, the former having been given by Stephens in 1827 and the latter soon afterwards. Both these are shown in the *Atlas of the British Flora* to be distributed abundantly throughout Britain. Yet *galathea* has always been restricted, certainly since Edward Newman's *British Butterflies* of 1870, to the chalk and limestone south of a line Tenby to the Wash, with an outpost in the Yorkshire Wolds. Moreover, within these bounds it is confined to small perennial enclaves. In captivity it has been found to eat "any" kind of grass. Why is it so local?

Its ovipositing habits will bear examination. E. Newman (1870: 78) quoted the observation of G. C. Bignell of Plymouth: "settles indiscriminately on any leaf or stalk that may be nearest at hand, and drops her eggs at random, careless of what species of grass may happen to receive it; only one egg is extruded at a time, [then] the female flies a few inches or a few feet and repeats the operation". These observations were made from watching a number of females, apparently in the wild. Except by Frohawk, these details do not seem to have been repeated since, later authors being content cautiously to say that the eggs "are not attached to anything". However, within the last four years a well illustrated book with rather sketchy text states: "The females have the peculiar habit of dropping the eggs quite casually amongst the grass and herbage as they fly". This is a very different method, which must be difficult to observe. Precise details would be interesting.

In captivity, my female was alternately fluttering and feeding in the sunshine of the afternoon of 17th July 1971, in a large perspex tank inverted over a black tray with some grass and flowers. A cloud hid the sun and she settled on a stem, with wings closed. After 25 seconds she shifted her legs and, 15 seconds later, with a loud and satisfying "click, click", an egg bounced on the tray and rolled away. After another 25+15 seconds of the same routine a second egg followed, and in all four eggs were dropped from the same perch with exactly the same procedure before the sun reappeared and she resumed fluttering. The instant hardening of the eggs is a remarkable adaptation; they actually do bounce. Being above the insect, I was unable to observe the nature of the slight but definite shift closely, nor the process of extrusion.

I would not agree that the female drops her eggs either "casually" or "regardless of where they fall". Nature is wise, and "Mother knows best" and I suspect she has a very shrewd instinct that her seed will fall on suitable ground. There was certainly a good steamy scent of hay in the tank where my female laid, an atmosphere which may act as one of her "releasers". The restricted range of the species despite its ability to live on almost any kind of grass may indicate very circumspect laying habits.

This method of ovipositing is a specific character. The

related *M. russiae suwarovius* (= *japygia*) used to be found at Pusztaszer in Hungary, and Frohawk & Rothschild (1913, *Entomologist* 46: 275-278) observed it, the former giving a beautiful sketch. Alighting near the tip of a grass blade which bends over with her weight, the female swings underneath sideways by her hinder legs, curls her abdomen up in a circle and lays on the upperside of the blade between her feet. As she flies away the blade jerks upright and the eggs (up to four) remain fixed. Various plants were so used, but the larvae were found in this case to prefer *Poa annua*.

The eggs of *galathea* are adapted for free-laying in that they are both hard and round. Mine were much more nearly spherical than in any illustration I have seen of them, with minute flat faces and two almost imperceptible flat "ends" (which could have been formed in bouncing). Minute golf balls were immediately thought of. The Ringlet (*A. hyperantus* L.) also lays free eggs. My two were prolific in the same tank with *galathea*. The eggs were easily identifiable, as those of *galathea* are at least double the size of any other of our Satyridae, and chalky white. Those of *hyperantus* are normal in size and pale greenish white, and I am not sure that they are immediately hard, not having observed actual laying. Incidentally, the "adhesive" of several other of our Satyridae is very weak. In particular my specimens of the Gatekeeper (*M. tithonus* L.) and the Meadow Brown (*M. jurtina* L.), which all showed a marked preference for laying on the inverted bowl instead of on the plants of grass provided, used so weak a fixing agent that the eggs were easily removed with a paintbrush.

Everything in the garden is not invariably lovely. With several other males I was attracted to a female *galathea* on the sunny afternoon of 13th July 1971, at Ivinghoe Beacon. About a dozen of us converged on her, then all but me hurried on. I picked her up. Her feebly agitated wings were fully grown but still limp, and the tip of her abdomen was pierced by the beak of a very large immature brown Hemipterid, which must have caught her very soon after emergence. She did not recover. The bug changed in captivity to its penultimate instar but then unfortunately died, and has not been identified.

To complete the record, my female was observed *in cop.* on 12th July 1971 and was captured when the pair parted. Eggs laid on 16th-17th July hatched on 9th-11th August, remaining identical in appearance during those 25 days. The first indication of hatching was a tiny black dot which rapidly increased in size as the larval head emerged. Half the shell appeared to be eaten. The larvae were immediately released onto "grass" (regardless of the species) in the corner of my garden. The Marbled White is not one of the 21 species seen flying in my garden during the last six years, nor have I seen one within a mile of here.

Scotland in September

By D. O'KEEFFE

Few collectors seem to visit the Highlands in September, probably because most of the species on the wing at that time of year can be obtained in better condition at the end of August. However, for those who wish to see and collect *Coenocalpe lapidata* Hübn. in its native haunts, the trip is essential.

In September 1970 Dick Chatelain and I made the journey, but were largely unsuccessful due to the very cold weather conditions we encountered (*vide Ent. Record* 83:45). On the evening of September 11th, 1971 I again headed north in company with Bernard Skinner and Peter Rogers, and we were fortunate to hit a period of weather as unseasonably warm as the previous one had been cold.

After an all night drive, we arrived at Struan in the early morning sunshine, and as it was too early to seek out accommodation we set to work searching and sweeping the bog myrtle beside the well-known posts on which *Lycia lapponaria* Boisd. occurs in the spring. Larvae were scarce, however, and an hour's work yielded only a few *Acronicta manyanthidis* Esp., *Rheumaptera hastata nigrescens* Prout, *Ceramica pisi* L. and very small *Polia hepatica* Clerck.

Luckily we obtained accommodation at a farmhouse near Trinafour, where we received royal treatment throughout our stay, and we soon set out our traps on the *lapidata* ground. By mid afternoon it had become very warm and the temperature was high in the seventies when we started to patrol the rushy ground on the lookout for female *lapidata*. Just after 3.30 p.m. the first one was taken and in all we took 13 females up to 5.00 p.m. when the flight ceased. We also kicked up two males, but unlike the females they do not appear to fly during the daytime unless disturbed.

The female *lapidata* did not fly as freely as we had expected, however, nor was it possible to walk them up, because when disturbed they feigned death and fell straight down into the rushes. We found the best way to take them was to stand still or sit on a rock carefully surveying an area of rushes; suddenly a *lapidata* would appear for a few seconds only, fly a few yards close over the rush heads and settle on top of one of them, when it was then easy to net. *Eulithis testata* L., being very common, was at first quite a pest, but we soon learned to differentiate the two species in flight; *testata* flying much higher and for a greater distance than *lapidata*, and appearing much paler on the wing.

As darkness approached, the sky clouded over and it became obvious that the night was going to be warm. We had carefully sited our static traps among patches of rushes and were hopeful that these would provide us with the night-flying male *lapidata* we still needed. After dark we decided to search the area where we had been successful in the after-

noon. At about 8.00 p.m. the first male *lapidata* was taken fluttering up a rush stem, and during the next hour we found a further 15 in this manner.

The following morning we were surprised to find only one male *lapidata* in one of our M.V. traps in spite of it having been a very good night, the traps containing many hundreds of moths. In addition to those at Trinafour we also had two traps installed at Struan, where we also had a big catch, but without any *lapidata* although the only specimen taken the previous year had been at this site.

The remainder of the morning was spent sweeping bog myrtle with similar results to those of the previous day. After lunch we beat *Salix aurita* high up on the hillside above Trinafour obtaining larvae of *Hydriomena ruberata* Freyer quite commonly.

At 3.30 p.m. we again took up stations among the rushes and succeeded in taking a further 22 female *lapidata* by 5 p.m. That evening searching the rushes produced 27 males and four females. Our best hopes had been exceeded and we were each able to select a perfect series, releasing those not required.

That night again proved a very good one for light with many hundreds of moths in the traps at Trinafour and Struan including 2 male *lapidata* at Struan. The two successive good nights enabled us to record an astonishing range of species for the time of year, the main flight period of many of them having ended weeks earlier.

Our final afternoon was spent beating juniper at Aviemore in pouring rain for pupae of *Thera juniperata* Scotica White and larvae of *Eupithecia intricata millieraria* Wnuk. in which we were successful. We returned early to Trinafour to pack up our equipment so as to make a prompt start home the following morning after a highly successful and immensely enjoyable three days in the Highlands.

Species noted from 12th to 14th September 1971 were:—

Diacrisia sannio L. Larvae on bog myrtle, Struan.

Pheosia gnoma Fabr. 1 at Struan.

Trichiura crataegi L. Fairly common at Trinafour.

Ptilodon capucina L. Larvae on *Salix aurita* Trinafour.

Loathoe populi L. Larvae on *Salix aurita* Trinafour.

Trichiura crataegi L. Fairly common at Trinafour.

Macrothylacia rubi L. Larvae at Trinafour.

Acronycta menyanthidis scotica Tutt. A few larvae at Struan and Trinafour.

Amathes agathina Dup. A few at Trinafour.

Engnorisma depuncta L. Several at Struan and Trinafour.

Amathes castanea Esp. Larvae on bog myrtle, Struan.

Amathes baia D. & Schiff. 1 at Trinafour.

Diarsia dahlii Hübn. Fairly common at Struan and Trinafour.

D. rubi View. 1 at Trinafour.

Lycophotia porphyria D. & Schiff. Larvae at Struan on heather

Noctua comes Hübn. Several at Trinafour.

- N. pronuba* L. Several at Trinafour
N. fimbriata Schr. 1 at Trinafour.
Polia hepatica Clerck. Larvae at Struan on bog myrtle.
Eurois occulta L. One grey ♀ at Trinafour.
Lacanobia contigua D. & Schiff. 1 larva at Struan.
Cerapteryx graminis L. A few at Trinafour.
Cleoceris viminalis Fabr. Several at Trinafour.
Blepharita adusta Esp. 1 larva at Struan.
Apamia monoglypha Hufn. Fairly common at Struan and Trinafour, mostly black.
Mesapamia secalis L. A few at Trinafour and Struan.
Antitype chi L. A few at Trinafour and Struan.
 mainly still fresh
Aporophyla nigra Haw. Common at Trinafour and Struan.
A. lunebergensis Frey. Several at Trinafour and Struan.
Amphipoea lucens Frey. Common at Trinafour and Struan.
A. crinanensis Barr. Common at Trinafour and Struan. } genitalia checked.
A. oculate L. Common at Trinafour and Struan. }
Celaena haworthii Curt. Common by day at Trinafour. Less so to M.V.
C. leucostigma scotica Cock. Common at Trinafour.
Hydrecia micacea Esp. Common at Trinafour and Struan.
Gortyna flavago D. & Schiff. Fairly common at Struan.
 Few at Trinafour.
Rhizedra lutosa Hübn. 1 at Trinafour.
Ceramica pisi L. Larvae at Trinafour and Struan.
Nonogria typhae Thunb. 1 at Trinafour.
Photodes pygmina Haw. Common at Trinafour and Struan.
Stilbia anomala Haw. A few at Trinafour.
Amphipyra tragopoginis Clerck. Fairly common at Trinafour and Struan.
Parastichtis suspecta Hübn. A few at Trinafour and Struan.
Agrochola circellaris Hufn. Fairly common at T & S. .
A. macilenta Hübn. Fairly common at T. & S.
A. litura L. Fairly common at T. & S.
A. helvola L. A few at Struan.
Xanthia icteritia Hufn. Fairly common at Struan.
X. togata Esp. Fairly common at Struan.
Lithomoia solidaginis Hübn. Common at T. & S.
Xylena vetusta Hübn. Common at Trinafour, a few only at Struan.
E. exsoleta L. 1 at Trinafour.
Plusia chrysitis L. A few at both T. & S.
Autographa gamma L. A few at both T. & S.
Hypena proboscidalis L. Several at Trinafour.
Xanthorrhoe fluctuata L. A few at both T. & S.
Perizoma didymata L. A few at Trinafour
Chesias legatella D. & Schiff. Several at Trinafour.
Eulithis populata L. 1 at Trinafour.
E. testata L. Very common at both T. & S.
Hydriomena furcata Thunb. A few at Trinafour.

H. ruberata Frey. Larvae common on *Salix aurita* at Trinafour. *Rheumaptera hastata nigrescens* Prout. A few larvae on bog myrtle at Trinafour and Struan.

Chloroclysta citrata L. Common at both T. & S.

C. miata L. Fairly common at both T. & S.

C. siterata Hufn.. Several at both T. & S.

Plemyria rubiginata D. & Schiff. 1 at Trinafour

Coenocalpe lapidata Hübn. Common at Trinafour, 2 to M.V. at Struan. (see text).

Thera juniperata scotica White. Larvae and pupae fairly common on juniper at Aviemore.

T. firmata Hübn. Several at Trinafour.

Eupithecia nanata angusta Prout. A few at both T. & S.

Eupithecia intricata millieraria Wnuk. Larvae common on juniper at Aviemore.

E. indigata Hubn. Larvae on pine at Aviemore.

Ennomos alniaria. Common at Struan.

Epione repandaria Hufn. 1 at Trinafour.

Odontopera bidentata Clerck. A larva on bog myrtle at Struan

Opisthograptis luteolata L. A few at both T. & S.

Cabera exanthemata Scop. Larvae common on willow.

Bupalis piniaria L. Larvae on pine at Aviemore.

What is *Stigmella hodgkinsoni* (Stt.)? (Lep. Nepticulidae)

By S. C. S. BROWN

In April 1884, J. B. Hodgkinson, of Leyland, near Preston, Lancs., reared three specimens, two males and a female of a Nepticulid from mines found the previous autumn on garden rose. He at first thought that they were *centifoliella* Zell., but as he had some doubts, he sent them to Stainton for his opinion. Stainton had no hesitation in determining that they were not *centifoliella*, but a new species. He was so positive about this that he writes: "The very first glance I had of Mr Hodgkinson's specimens satisfied me (as it did also Mr Boyd) that it was a very different species from *centifoliella*". The following is his description: "Tuft of the head black. Anterior wings with the entire basal portion rich golden-brown (with no tinge of purple before the fascia), fascia placed beyond the middle, nearly perpendicular, bright pale golden; beyond the fascia the apical portion is deep purple, with the cilia grey. There are two specimens exactly alike, which both appear to be males. The third specimen is a female, which has the basal portion of the anterior wings paler, more bronzy; the fascia is more of a silvery lustre, and rather obliquely placed". In the autumn of 1884 Hodgkinson found further mines in the same locality. According to Tutt, Threlfall had bred a Nepticulid, which agreed to Stainton's description, in 1881, from mines found the previous August at Preston. Meyrick in 1895 considered *hodgkinsoni* to be a good species, but Tutt, in 1899, expressed his doubts. His views were shared by W. H. B.

Fletcher, with whom he had been in correspondence on the matter. Staudinger and Rebel in 1901 listed it as a distinct species. E. G. R. Waters in 1924 made a passing reference, but considered it most likely that *hodgkinsoni* was the same species as *centifoliella*. In 1928 Meyrick put *hodgkinsoni* as a synonym. In 1937 Prof. Martin Hering considered them to be distinct. L. T. Ford, in 1949, lists the two as distinct species, but says of *hodgkinsoni*: "Habits similar to those of *N.entifoliella*; possibly only a form of that species". By 1957 Prof. Hering had changed his opinion, for he now considered *hodgkinsoni* to be a synonym of *centifoliella*. In 1969 I paid a visit to the British Museum (Nat. Hist.) to see if there were any specimens of *hodgkinsoni* there. The General Collection had 8 specimens labelled *hodgkinsoni*, bred from mines found at Leyland, Lancs. They came from the Hodgkinson collection which was sold at Stevens in 1897. There were no *hodgkinsoni* in the Stainton Collection, so it appears that Stainton did not keep any of the three original specimens he received from Hodgkinson. In the Bankes Collection were 8 specimens labelled as bred by Hodgkinson from Leyland, Lancs., circa 1890 from rose. Included in the series were two empty cocoons, one brown, one black. I was given permission to take three specimens, two males and one female, out of this collection for a detailed examination. Firstly, as regards the coloration of the head: This was blackish-brown, and agreed with Stainton's description. Taking into consideration that these three specimens were about 80 years old, and could have become faded, nevertheless, the colour of the fore-wings did not tally with either the original description nor with a series of *centifoliella* bred from Portland in my own collection. In *centifoliella* the basal half of the forewing before the fascia is rather a dull, purplish-brown colour, somewhat heavily scaled. In *hodgkinsoni* the basal half is of a shining purplish-brown, with some silvery scales at the extreme base. In the original description Stainton emphasises the absence of a purplish tinge in the colour of the forewings before the fascia. To my mind, *hodgkinsoni* has a brighter, more glossy appearance than *centifoliella*. I examined the genitalia of the two males, but I could not detect any difference between those and males of *centifoliella* from Portland, nor did they differ from the figure and description of the genitalia of *centifoliella* as given by Brian P. Beirne. Now that interest in the Nepticulids has revived after an almost total neglect for so many years, it is to be hoped that mines could be looked for in the original locality and the problem perhaps solved. My thanks are due to the Trustees of the British Museum for permission to examine the three specimens.

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Plebejus argus (L) *caernensis* Thompson. A Stenoecious Geotype

By R. L. H. DENNIS

In a recent work on *Eumenis semele thyone* Th., the writer pointed out the remarkable parallelism of the distributional and morpho-reductionalist criteria connecting this sub-species with *P. argus caernensis* Th. He explained that any historical reconstruction of their origin must take into account the nature of both subspecies, and that certain points were foremost in any discussion:—

(i) The remarkable sympatric distribution on the west side of the Gt. Orme of two totally unrelated sub-species.

(ii) The certified parallelism in their genetic endowment such as the early emergence and dwarfed nature of both sub-species.

(iii) The final facet, though not perhaps as remarkable as previous authors have held it to be, is the unusual environment of *P. argus* on limestone slopes, and its adopted foodplant—*Helianthemum nummularium*.

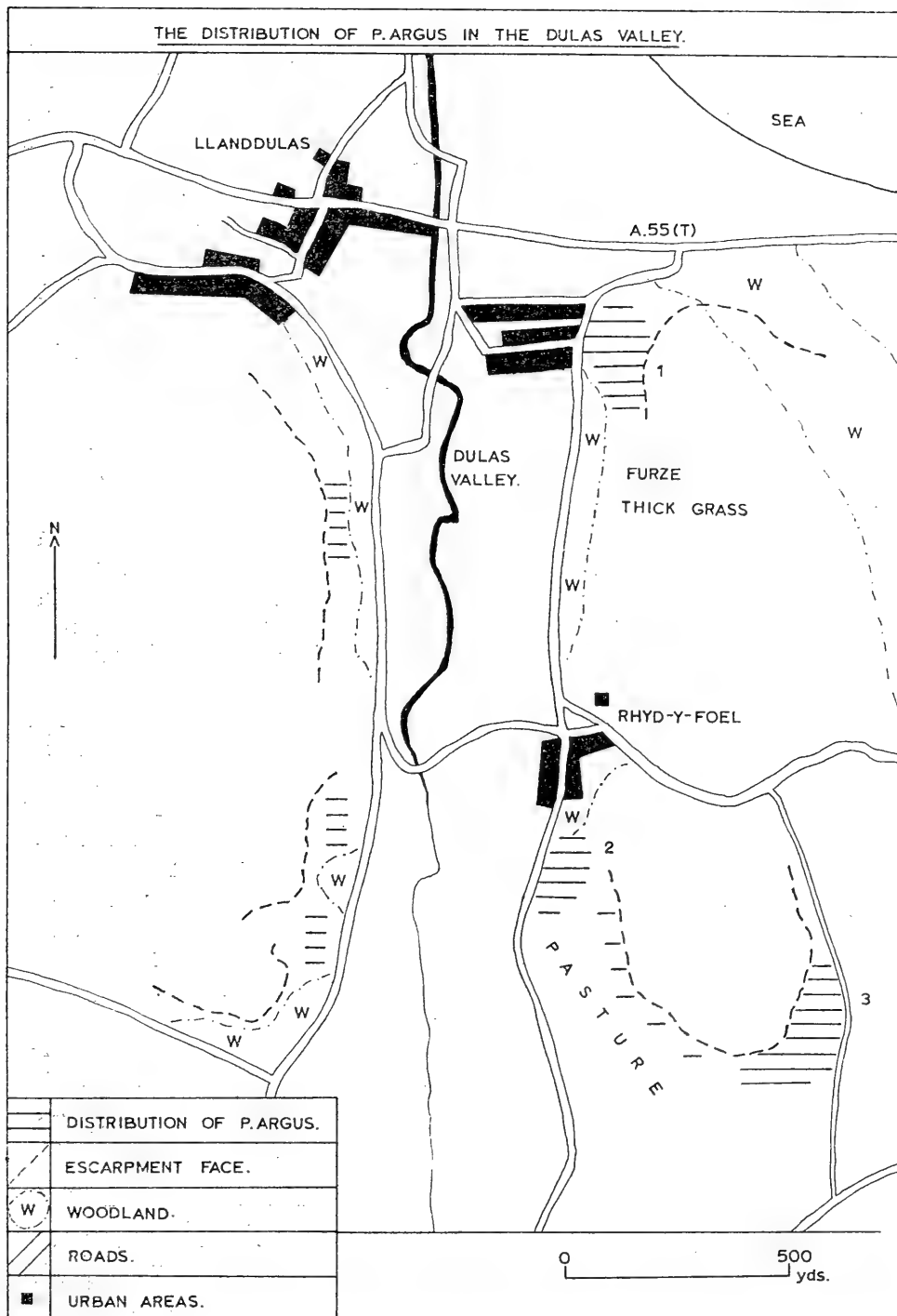
This paper is not intended as an all inclusive work on the subject of this race, but provides a stop-gap covering two aspects of some importance. The first is a brief account of the distributional and morpho-criteria of the race, pointing out some of the changes that have occurred with time in the colonies; and dealing with aspects of *caernensis* that would reflect upon conclusions concerning the origins of both races dealt with in an earlier account on *E. semele thyone* Th. These form topic headings. The second feature of the article, and one that will re-emerge from time to time in the discussion, is the correction of misinterpretations and information given on *caernensis*.

The Distribution of P. Argus caernensis Th.

The information available to most readers on this subject is contained in Ford's 'Butterflies'. He was provided with this information by J. A. Thompson, and the latter has of him-

self written a short paper on the subject. Yet the data contained in Ford's volume is surprisingly misleading:—

"*P. argus caernensis* is to be found at a considerable elevation on limestone cliffs at several places on the north coast of Caernarvon" (Ford 1945, 1957, 296).



It is in fact only to be found on the Gt. Orme and in the Dulas Valley at Rhod-y-Foel. G. Ellis (1949) did report (presumably from his own records) an occurrence of the race on

the Creuddyn limestone at Pabo; this however indicates on the absence of Gloddaeth records, that dispersal from the Gt. Orme had miraculously avoided the most northerly limestone ridge on the Creuddyn, that adjacent to the Gt. Orme, or that the insect had been extinguished there prior to his observations.

The 1940's represented an exceptional period in every way. Comparison of the writer's records over the past 4 years with those of G. Ellis and earlier recorders indicates that many species once seen on the Creuddyn are no longer to be found there. It is quite possible that in this period *P. argus caernensis* spread beyond its markedly limited zone on the Gt. Orme. Even now in a period of climatic deterioration, the numbers of the insect are prodigious, to the extent that in some areas on the Gt. Orme it is difficult to walk without stepping on them; J. A. Thompson describes them as being in proliferation in the 1940's. This means that with every chance of favourable anemochore dispersal provided by constant north-westerly winds and gales in June, some of the number exposed to occasional displacement, and presumably many must be lost from the colony in this manner, could well have reached and colonized the Creuddyn Peninsular.

It must, however, be stressed that the Creuddyn Peninsular is neither a distributional zone for the subspecies, nor its location of origin. Constant surveying of the limestone areas along the N. Wales coast by the writer has shown that it is absent from the Creuddyn to Prestatyn, but for the important Rhyd-y-Foel colonies.

Its presence on the limestone slopes at Rhyd-y-Foel (maps 3 and 4 antea pp. 5 and 6 and Fig. 1) is easily explained. In 1952, Thompson mentioned the fact that he and Merchant had introduced *P. argus* to the Dulas Valley in 1948. Yet he neither mentioned the balance of numbers involved nor the location of this artificial introduction. (It is of crucial importance to have this data.) However, the current distribution is contained in fig. 1 (1971), and indicates that the species has now established three colonies on the east side of the valley, and that on the western side it has a more continuous spatial setting, yet its numbers are always low.

It is, of course, of much greater importance to know the exact confines of the insect's distribution. This information has been covered in fig. 1 here, and in fig 1 of the preceding article on *E. semele thyone* Th. Yet this information is not particularly valuable without environmental data.

A remarkable feature of the race on the Gt. Orme is contained in the widespread distribution of *H. nummularium*—which is to be found everywhere on the headland but for the enclosed farmland areas on the summit table area—and the narrowly defined distributional zone of *P. argus* on the western side, with smaller colonies to the south. It is obvious, then, that the insect does not occupy the total area provided by the foodplant, and that other factors limit its distribution. It

vertical extent on the headland is equally revealing. In the quotation given above, E. B. Ford gives the impression that the species is only found at considerable elevation on the Gt. Orme. In fact, it is found along the total length of the Marine drive from 20 ft. above O.D. through the contours to well over 400 ft., and its abundance at these elevations is only affected by the spatial magnitude of habitats provided for it. It is not the difference in altitude on the Gt. Orme that controls *argus* distribution, but the alterations in topography, and dependent factors. The actual confinement of the subspecies is contained within shallow, well-vegetated recesses on the limestone slopes, below the sheer escarpment faces. On more exposed slopes bounding the hollows, and on thinly vegetated slopes towards the summit in the absence of rock outcrops, population density is reduced markedly, and finally to zero.

In many ways, similar optimum conditions for the subspecies appear to present themselves on the east side of the Gt. Orme, yet the grass cover is generally thinner, and the only cover provided is bracken and a thick crop of dwarf furze. On the west side, the subspecies avoids the areas of furze, where the vegetation is presumably too dense for *H. nummularium*; yet it has a strong preference for the path along which the telegraph poles have been placed, and along similar stretches where cover is provided in clusters of fern, *rubus* ssp., juniper and Cotoneaster, and where the grass is thicker, and *H. nummularium* in greater density. During cloudy weather they become lost within this vegetative blanket. The restricted colonies at Rhyd-y-Foel are easily explained in terms of breaks effected by grazing (between Colonies 2 and 3), thick vegetation (between Colonies 1 and 2), and at high elevation above the escarpment faces where vegetation becomes extremely thin. The colonies in the Dulas Valley are neither large in areal extent, nor in terms of population numbers. As the insects, especially the males, are so evident while resting on the vegetation, it may well be presumed that insectivorous birds, of which there are many in the Dulas Valley, select heavily upon the species there. The differences between the Dulas Valley and Gt. Orme localities can perhaps be gauged from the alterations in frequency of certain morphological facets over the past 23 years. In this way the two populations perhaps act as indicators of different selective pressures.

It must perhaps be asked how unusual this environment is for *P. argus*. Elsewhere in N. Wales it was known on sandhills in the Lleyen Peninsular (Abersoch. G. Smith 1949) and on heathland in Anglesey (Trearddur Bay 1971). The Baron de Worms (1949) has indicated its eurytopism well enough:—

“In this country *Plebejus argus* affects large heathy tracts, mosses in the North, downlands, chalk cliffs, limestone cliffs, and even sandhills. Of these types of terrain it produces several local forms and many more abroad”.

Its calcareous environment is then not so unusual. In

Kent, f. *cretacea*, and in Hampshire a downland population, both occupy chalk areas. It may well be that *P. argus* is then not only eurescious but also euryphagous, and this is adequately displayed in the lists of foodplants provided for it by many authorities. One feature is certain, and that is the ability of the species to occupy totally different environments and to produce local races. This is explained by the isolation of the colonies and the adaptability and variability of the species' gene pool.

The Morphocriteria of the Micro-geographical race caernensis
Th. Samples.

Over the past three years, the writer has extracted a sample of *argus* from the Gt. Orme. The method of doing this is contained in the previous article on *E. semele thyone* Th. The means for various features were calculated for each annual sample, and very little variation was obtained between the individual samples, indicating that the phenae were stabilized over that period.

During the last two weeks in June this year, a sample was taken from Rhyd-y-Foel Colony 1, perhaps the site of the artificial introduction in 1948. Also on the 20th July this year, as a measure of comparison, a sample of *P. argus* was acquired from Trearddur Bay near Holyhead, Anglesey; in the following discussion it must be continually borne in mind that this sample is the product of a day's sampling alone, and that this may well affect the statistical tests. The total area of each colony was covered by continual transects.

	Gt. Orme	Rhyd-y-Foel	Trearddur Bay	Samples
♂ ♂	54	26	29	
♀ ♀	56	25	19	
	Lst. Grassland	Lst. Grassland	Mica-schist Heath	

Features

The main aspects of the race are well known. The butterfly merges earlier than *P. argus* elsewhere, very often before *E. semele thyone* Th., and it is again a dwarfed race.

E. B. Ford has indicated that the males are pale blue and their black marginal borders are much reduced. "The females are always marked with blue", and "The orange lunules are inconspicuous or absent, never well developed".

Emergence date.—The race *caernensis* Th. is often on the wing in the second week of June, and certainly in full numbers by the 15th June. Its flight period is often considerably protracted, and the writer has seen it though in a somewhat pitiful condition, in early August (1970). In the Dulas Valley, the insect emerges slightly later than on the Gt. Orme; for instance this year *P. argus* was out on the Gt. Orme before the 15th June, and the females were on the wing, though in smaller numbers on the 18th June. In the Dulas Valley at Colony 1, on the 17th June, the males were just in the process of emerging and a single female was noticed by Mr J. Richens on the 20th June. Also the flight period comes to an earlier halt in the Dulas Valley, being at an end on the 17th July. *P. argus* at Trearddur is a July butterfly, and is separated temporally from the race *caernensis* perhaps in a similar way that *thyone* Th. is segregated from *nomino*-typical *semele*.

Size.—As measurements here follow the procedure described in an earlier article on *thyone* Th., no comparison can be easily made with figures given by E. B. Ford. The means of the various populations are given below:—

	Gt. Orme	Rhyd-y-Foel	Trearddur Bay	Wing expanse
♂ ♂	27.6	28.8	29.1	mm.
♀ ♀	26.3	27.2	27.9	mm.

Various tests were applied and indicated the following relationship:

Gt. Orme v Trearddur Bay. ♂ ♂ $\chi^2_{(3)}$ 12.54. $P < 0.01 > 0.001$.

Significant.

Gt. Orme v Rhyd-y-Foel. ♂ ♂ $\chi^2_{(3)}$ 7.0. $P < 0.1 > 0.05$. Not significant.

Gt. Orme v Rhyd-y-Foel. ♀ ♀ $\chi^2_{(2)}$ 3.37. $P > 0.1$. Not significant.

(The Trearddur female sample was too small to apply a chi test.)

Certainly, the test would indicate that *caernensis* is significantly smaller than *argus* elsewhere, exemplified in this case by the Trearddur population. Yet it is not separated to a significant level from its related population in the Dulas Valley. Though the Rhyd-y-Foel figures are not perhaps large enough, nor have been collected over several years, yet a shift in the mean size of this population from typical *caernensis* is suggested by the actual figures themselves, and by the statistical tests; though on the other hand the difference may be no greater than that controlled by chance.

Markings and coloration.—It is not proposed to give a detailed analysis of these *P. argus* populations here; yet certain distinctive features can well be appreciated.

It is difficult to express the difference that exists in the

coloration of blue in the males between the *caernensis* and Trearddur series, except to confirm this without a subjective assessment; in the same way it may be added that the black border certainly appears to be reduced in *caernensis* specimens.

Some real differences can however actually be expressed objectively:—

♀ ♀—White/bluish spots on the HW. UP., distal to the black marginal spots. These range in number from 0-7 in Trearddur *argus*. Sometimes they are absent (5/19) and usually 6 or 7 are present (9/19). The important fact is that in *caernensis* females, they are usually not to be seen, or are heavily suppressed and hardly noticeable.

♀ ♀—Orange lunules HM. UP., sub-marginal. It was mentioned above that E. B. Ford described the absence of the spots as one of the conspicuous features of the race *caernensis*. If indeed this was so in the 1940's, a marked change has occurred in the population both on the Gt. Orme and in the Dulas Valley. The means are given below:—

♀ ♀—Gt. Orme 4·8; Rhyd-y-Foel 4·2; Trearddur Bay 3·05 (the orange lunules of the Trearddur series are a redder orange).

They indicate to the contrary that the orange lunules are perhaps a central feature of the race; and this is amply displayed in the results given below:—

Gt. Orme v Rhyd-y-Foel ♀ ♀ $\chi^2_{(2)}$ 7·9. $P < 0·05 > 0·01$.

Gt. Orme v Trearddur ♀ ♀ $\chi^2_{(2)}$ 12·54. $P < 0·01 > 0·001$.

As the writer would not question J. A. Thompson's assessment of the race, nor the information that he supplied to E. B. Ford, the above can have only one indication. This case exemplifies the nature of a complete shift in genetic frequencies; one that is probably related to current selective pressures operating within the maximum limits of a span of thirty years or so. It will be of great interest to follow this situation, and to see whether it is connected to a temporary period of variability (as those of *E. aurinia* described by E. B. Ford 1964) or to a new level of stability, and one of greater permanence.

♀ ♀ Extension of violet on FW. UP. As a final comparison here—though there are additional features that can be assessed—nominal data of the extension of the blue area on the FW. UP. of the females can be tabulated in the manner shown below:—

	Gt. Orme	Trearddur Bay
None	4	7
Discal confinement	21	11
Discal and marginal zones	5	1
Extensive coverage	6	0

A glance at the figures will reveal an immediate asymmetry in a comparison of the data sets; but it also indicates that the amount of blue on UP of *caernensis* is perhaps not as great as is often assumed. A corollary of this may be included here. Whereas the area not covered by blue scales on the *caernensis* upperside tends towards a black-brown coloration, the Trearddur equivalent is a more true brown.

Overlap Characteristics, Population Changes and a Historical Reconstruction

There are two reasons for the above discussion. The first is to illustrate that the somewhat different habitat of *caernensis* is not as unusual as some authorities (B. P. Beirne, 1947) have assumed; that its fixation on the limestone headland and its choice of foodplant is perhaps well within current adaptability, negating Beirne's suggestions of glacial refugium in N. Wales.

Secondly, the overlap characteristics and population changes both on the Gt. Orme and in the Dulas Valley experiment, illustrate that not one of the discriminate features separating *caernensis* from *argus* populations is entirely successful. A dispersion diagram of the flight period and morphological characteristics would display a marked overlap of *caernensis* with the nominotypical populations (even in the absence of contiguous *argus* populations). Certainly *caernensis* may appear somewhat more unusual than other *argus* races, but it must be borne in mind that it and ssp. *masseyi* (Westmorland) are at the northerly limit of their range in Britain, and are very likely under more severe selective pressures.

In view of Weichselian geomorphological data briefly given in the previous article on *thyone* Th., and in respect of the thermal limits of *P. argus* in Britain and Scandinavia (South of July \pm 59°F), B. P. Beirne's suggestion of isolation and formation of this race on the headland during the Upper Pleniglacial is totally unrealistic.

It is more likely that arboreal confinement in one of the drier periods of the Flandrian (Boreal; Sub-Boreal) forced an *argus* population probably existing on the dune areas or *Ericaceae* covered boulder clay zones below the Gt. Orme, on to the limestone Headland, where it was well able to adapt itself to the hardy foodplant *H. nummularium*-characteristic of open places; ecological bounds well within the eurytopism of the species. It is likely that in this drier period, the Gt. Orme was desiccated to a greater extent than is at present usual; even in June (1970/71), the grass takes on a parched brown appearance. In the Boreal or Sub-Boreal drier climatic conditions, the insect may have been selected for rapid ontogeny in the manner described for *thyone* Th. Yet the difference cannot be great, since even in the absence of contiguous populations, the marked overlap of characteristics

with usual *argus* populations is indicative of the few factors involved, perhaps a single gene as E. B. Ford suggested.

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Why do Craneflies have Long Legs?

By ALAN E. STUBBS

Taxonomically one may regard Craneflies (Tipulidae) as primitive diptera, but in many respects they are quite advanced and their wide range of ecological adaptation and abundance shows them to be a successful group of insects. But one of the oddities about Craneflies is their long legs, surely not a 'primitive' character, which seem so cumbersome yet must have an advantageous role in the life of the adult crane-fly.

Craneflies belong to the group of diptera called Nematocera and it may be as well to review the length of legs found in the various families. Craneflies consist of the large family Tipulidae, plus the small families Trichoceridae, Anisopidae and Ptychopteridae, but for the purposes of the main discussion, only Tipulidae are considered, since information is sparse on the other small families. They are all elongate insects with relatively long wings, though Anisopidae contains more robust insects with relatively shorter legs. Among other Nematocera, the Culicidae (mosquitoes), Cecidomyiidae and Chironomidae have fairly long legs. In the latter family the forelegs are often particularly long, suggesting an adaptive role, but in the small dumpy species, such as *Cricotopus* females the legs are correspondingly shorter. A similar situation is found in Ceratopogonidae where the squat biting species have short legs. Simuliidae are short dumpy flies with short legs and broad short wings and Psychodidae fit into a similar pattern though less robust. The Mycetophilidae are a very varied group with some species not fitting the above pattern.

As a gross generalisation the picture emerges that long legs seem to be found when the insect is elongate and often the wings are also relatively elongate and narrow.

In some other groups of diptera, for instance *Leptogaster* (Asilidae) and *Baccha* (Syrphidae), there are elongate insects without unduly long legs (both examples are capable of hovering flight, unlike the Craneflies), so the Nematocera probably

have long legs for reasons other than ideal geometric proportions.

One must accept that the length of legs is but one of a number of integrated factors and, therefore, possibly cannot be considered in isolation. However, one can at least view in theory the possible advantages which might be gained.

If one watches a large cranefly in flight the legs are splayed out like feelers and in its apparently clumsy flight there must be some advantage in steering itself and avoiding damage to the wings as it tries to fly and fight (blunder?) its way through vegetation. It is becoming increasingly apparent that some species are mainly active at dusk or during the night so that sensors beyond the wings might be very useful.

The elongate body and aerodynamics of flight might make it very useful to have long spread legs for balance. The importance of balance is indicated by the modification of the hind pair of wings into halteres (gyroscopic stabilisers) and in such a primitive group of diptera, additional balancing aids may be advantageous. The flight is relatively slow and unsuited to hovering. Either the flight is direct with little apparent ability to change course, or a bouncing along flight or a complex highly erratic flight (an up and down dancing flight is achieved during swarming in some species).

Hemmingsen (1952) who has studied the oviposition of Tipulids (rarely seen in most species) found that the females of some *Tipula* species hold their abdomen vertical as they bore into the ground tail first, the long legs being necessary to support the body in this position and assist in raising the abdomen from the burrow. They cannot manage if one of the hind legs is missing. This was the fundamental reason for long legs in his opinion. It may be pointed out, however, that species which do not adopt this burrowing posture have equally long legs, e.g. *Tipula vernalis* Mg., and one must take account of species such as *Tipula pagana* Mg. and *Limnophila pulchella* Mg., where the male is fully winged and the female brachypterous. In the latter two species the male has longer legs than the female, surely an indication of advantage in flight.

Wesenberg-Lund (in Hemmingsen, *op. cit.*) had earlier suggested that long legs enabled Tipulids to hang between grasses but it would possibly be better to consider their advantage in moving through vegetation since some species crawl up through vegetation when they emerge and the females crawl down to lay their eggs—the ease with which harvestmen (Arachnida: Phalangida) walk through vegetation is a parallel.

Long legs may also be useful in avoiding predators. There is something very strange about a large cranefly being difficult to follow with the eye as it flies. The long legs somehow help delude one as to the location of the body, and this is carried to the extreme in *Dolichopeza albipes* Stroem. where one often only sees six widely spread white tarsi which dis-

tract one's attention from the rest of the sombre-coloured insect.

Some craneflies are well camouflaged with mottled wings folded over the body as they rest on tree trunks. The splayed legs are often similarly camouflaged with light and dark rings so a predator may attack the wrong part of the insect even if the fly is detected. If the insect flies off from a camouflaged position, the predator is likely to be startled by finding an insect deceptively larger than it had bargained for, the long legs helping to ghost a large outline.

Some species bob up and down on their legs (a sort of fast springy knees bend) at such a speed that the outline of the insect is blurred. A predator may well miss or have second thoughts about attacking when it cannot see what manner of beast is involved. Hemmingsen referred to this behaviour as a vacuum activity (just to pass the time away) but my own observations show that bobbing can be instigated by disturbance as one approaches and the action generally stops if one remains still. Such bobbing is only effective on long legs.

The long legs are relatively easy to grasp by a predator, and they are fragile and readily break off, an escape mechanism very reminiscent of lizard tails.

Whilst craneflies are quite frequently found in spiders webs, one may suppose that a long outstretched leg to be the part of the fly most likely to engage with the web. Since the leg is slender, only a small area of the leg will be stuck to the web relative to the insect's strength, so there should be a good chance of breaking free, or only losing a fragile leg if in greater difficulty.

Some species of cranefly, especially when sitting in camouflaged or exposed positions, seem to be excessively sensitive to sound as one approaches. Presumably the legs or leg bristles are sensitive to vibration, in which case a broad splay of sensors would give particularly good reception.

Oldroyd (1964) refers to the habit of some craneflies of attracting a mate by waving the hind legs whilst hanging by their fore or fore and middle legs (a mainly tropical habit?). This, and other types of mating display, is essentially a secondary function and cannot be regarded as a primary reason for long legs.

As disadvantages, one might regard long legs as fragile, clumsy and of little strength, and whilst there seems to be no direct parallel in our native British insect fauna, reference has already been made to the harvestmen which demonstrate admirably that long legs can be an asset, at least in some circumstances.

Many of the possible advantages discussed do not apply to all craneflies because of differences in habit, particularly when one takes wingless ones into account. There is probably no single reason for long legs, but distinct advantages must exist for the group to be so successful.

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Notes and Observations

ARGYNNIS SELENE (D. & SCHIFF.): SECOND BROOD.—Mr Bretherton's note (*Ent. Rec.*, **83**: 325) of a wild second brood specimen of the Small Pearl-bordered Fritillary in Sussex on 27th August 1971 reminds me to report a similar occurrence. On 25th August 1971 I also took a specimen of the second brood of this butterfly, at Harlech in North Wales among the sand dunes. Unlike Mr Bretherton's capture, mine is a male, paler and considerably smaller than any of my normal specimens. It measures 36 mm. against 40-42 mm. for my first brood specimens of the same sex.—C. I. RUTHERFORD, Longridge, Macclesfield Road, Alderley Edge, Cheshire. 13.iii.1972.

POLYGONIA C-ALBUM L. IN KENT.—Judging by the number of reports I have received from various observers, this butterfly appears to be more numerous this spring than for some years past. I first noticed the butterfly this year in my garden here on 15th March, and on 9th April watched another at the edge of a wood between Hever and Chiddingstone as it was imbibing from sycamore blossom.—J. M. CHALMERS-HUNT. 10.iv.1972.

POLYGONIA C-ALBUM L. IN FLINTSHIRE, N. WALES.—Mr John Richens of Abergele has recently taken *Polygonia c-album* L. in Flintshire and has permitted me to record the following observations:

Rhydlydan SJ.33, 135736, 7 miles approximately north of Moel Famma; (1) Last week in August, one specimen; (2) Early September, two specimens; (3) Mid-September, four or five specimens observed.

He has also recorded the species at Abergele, SH.23, 935770.—R. L. H. DENNIS, 93 Abbey Road, Rhos-on-Sea, Colwyn Bay, N. Wales. 11.iv.1972.

CALOPHASIA LUNULA HUFN. IN HAMPSHIRE.—On 13th May 1971 I was surprised to detect among the rather sparse gathering of late spring moths in my mercury vapour light trap here, a fine specimen of *Calophasia lunula* Hufn. I think that this is possibly the first record of this insect in Hampshire.—R. HAYWARD, 40 Laurel Road, Locks Heath, Hampshire SO3 6QR.

HADENA COMPTA D. & SCHIFF. IN NORTH NORFOLK.—With reference to the note by Dr De Worms (antea: 79) on the occurrence of *Hadena compta* D. & Schiff. in North Norfolk, I have been remiss in not previously recording the capture of six specimens at light at Burnham Overy between 25th and 29th July 1963. I should also have published the capture in Ranworth Broad, on 23rd July of the same year, of four specimens of *Xanthorrhoe biriviata* Borkh.—DENZIL W. FFENNELL, Martyr Worthy Place, Nr. Winchester, Hants. 10.iv.1972.

PIERIS RAPAE L. LARVAE THROUGHOUT THE WINTER.—The extraordinary mild winter of 1971-72 has led to the survival of larvae of this white right through to 20th March. As a result of using a fairly large number of cabbages (variety "January King") for various feeding purposes, several larva of *P. rapae* have been noticed in each of the months December 1971 and January, February and March 1972. Curiously enough all the larvae were about the same size—early 5th instar, and appeared to be buried deep inside the cabbages, which came from various areas of Cambridgeshire.—BRIAN O. C. GARDINER, 18 Chesterton Hall Crescent, Cambridge. 21.iii.1972.

Current Notes

WARWICKSHIRE LEPIDOPTERA SURVEY

During 1957 and 58, in the pages of this and other entomological journals, the late Trevor Trought appealed for records of Warwickshire Lepidoptera for a new county list. This remained incomplete at his death, but the material gathered found an appropriate home in the County Museum.

With the setting up of the Biological Records Centre's National Data Bank and more recently the Warwickshire Trust for Nature Conservation, a new opportunity has presented itself to continue the Warwickshire Lepidoptera Survey in co-ordination with the work of both bodies.

Records for the survey would be gratefully received and fully acknowledged.

Full details may be obtained from The Recorders (David Brown & Roger Smith), WLS/RH, c/o The County Museum, Warwick.

(M. Enfield). Bearsted, 1949 (G. Law). [Chilham, June 16, 1957 (Grove, *Bull. Kent Fld. Cl.* **3**: 7, may refer to *P. affinitatum*—C.H.)].

8. Folkestone* (Ulyett, 1880). Near Alkham, 1930 (Morley, 1931). Wye* (Scott, 1936). Brook; Elmsted (Scott, 1950). Whinless Down, 1933 (E. & Y., 1949). Elham, one, July 4, 1934 (Busbridge, *Dairy*); one, 1953 (D. G. Marsh).

9. Margate, one on fence, July 17, 1923, in H. G. Gomm coll. (C.-H.).

10. Sevenoaks, July 26, 1919, July 17, 1920 (Gillett, *Diary*). Westerham, larva on *G. tetrahit*, September 19, 1945 (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1954-55**: 14).

11. Yalding (V.C.H., 1908). Watlingtonbury, one (E. Goodwin MS.); (V.C.H., 1908). Shipborne, one, 1910, in P. A. & D. J. A. Buxton coll. (C.-H.). Aylesford, five, 1951-54 (G. A. N. Davis). Hoads Wood, c. 1953 (P. Cue). Sevenoaks Weald, one at m.v.l., July 3, 1959, five, June 30-August 17, 1960 (E. A. Sadler).

12. Ham Street (Scott, 1936). Long Rope, Orlestone, one, July 27, 1951 (C.-H.). Potters Corner (Scott, 1936). Ashford, c. 1953 (P. Cue). Chart-ham, five (P. B. Wachter). West Ashford, one at light, August 1959, two, 1960, (M. Enfield). Orlestone Woods, July 28, 1956 (R. F. Bretherton). Willesborough, one, 1957 (M. Singleton).

13. Pembury, common (Stainton, *Man.*, **2**: 80). Tunbridge Wells, fairly common (Knipe, 1916). Goudhurst, common (W. V. D. Bolt, 1961).

14. Knock Wood, seven, c. 1855 (Beale, *Diary*). Sandhurst, one at light, 1928 (G. V. Bull). Tenterden, 1960 (C. G. Orpin).

15. Dungeness, July 27, 1956 (R. F. Bretherton); one, July 2, 1968 (R. E. Scott).

16. Folkestone, four at light, 1951 (A. M. Morley).

VARIATION.—One of my Andrews Wood specimens is referable to *ab. interrupta* Boldt (C.-H.).

FIRST RECORD, 1859: Stainton, *loc. cit.*

P. bifaciata Haworth: **unifasciata** Haworth: Barred Rivulet.

Native. Chalk downs and rough chalky and sandy fields, waste places, etc.; on *Bartsia odontites*.

1. Birch Wood (Stephens, *Haust.*, **3**: 300). Lewisham, 1947 (Stainton, *Zoologist*, 1915). Lee, 1861 (Fenn., *Ent. week. Int.*, **10**: 196). West Wickham, one (Forbes, *Entomologist*, **8**: 41); one, August 1958 (C.-H.). Forest Hill, two, 1861 (McLachlan, *Ent. week. Int.*, **10**: 102). Eltham, one at light (A. H. Jones, in Buckell and Prout, *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1900**: 68). Mottingham (C. Fenn, in *Wool. Surv.*, 1909). Beckenham (V.C.H., 1908). Keston, 1928 (W. A. Cope, in de Worms, *Lond. Nat.*, **1956**: 96). Sydenham, two larvae, 1934 (Attwood, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1934-35**: 44). Petts Wood, 1947 (E. Evans). Orpington, 1954 (L. W. Siggs); three larvae on *B. odontites*, October 5, 1968 (D. O'Keeffe). Sparrow Common, Crofton, 1965, plenty of larvae on *B. odontites*, all sizes, October 10, with still more, October 23 (R. G. Chatelain). Bromley, one, August 8, 1966 (D. R. M. Long).

2. Faversham (H. C. Huggins).

3. Herne Bay, on ragwort flowers, September 1867 (Buckmaster, *Ent. mon. Mag.*, **4**: 133). Whitstable, one, 1935, two, 1937, one, 1949 (P. F. Harris).

4. Westbere, one, August 3, 1946; Sandwich, a larva on *B. odontites*,

September 24, 1949, imago emerged August 1951 (C.-H.). Worth, ♀ at m.v.l., August 13, 1969 (T. W. Harman).

5. Westerham (R. C. Edwards). Downe, larva on *B. odontites*, September 3, 1955; Biggin Hill, larva on *B. odontites*, 1956 (C.-H.). Chelsfield, one, August 23, 1951, in A. M. & F. A. Swain coll. (C.-H.).

6. Greenhithe (Farn MS.). Gravesend* (Button, *Entomologist*, 4: 129, 5 393). Eynsford, not common (S. F. P. Blyth); larvae, 1933 (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1933-34: 42; idem, *Entomologist*, 67: 147). Fawkham; Pinden (E. J. Hare). Otford, one flying, July 7, 1956 (A. A. Allen).

6a. Chattenden (Chaney, 1884-87); in one hour's search, 60-70 larvae, October 11, 1890 (Fenn, *Diary*).

7. Wigmore Wood (Chaney, *loc. cit.*). Sittingbourne (H. C. Huggins). Boxley, one, 1908, in E. Goodwin coll. (C.-H.). Westwell, larva, September 1945 (E. Scott)

8. Near Dover (Stephens, *loc. cit.*). Dover (Curtis, *Br. Ent.*, 623); 1849 (Grant, *Zoologist*, 2583); annually (E. & Y., 1949). Deal* (E. & Y., 1949). Near Walmer* (Shepherd, *Entomologist*, 17: 137). Folkestone* (Ulliott, 1880). Folkestone Warren (Morley, 1931). Alkham, larvae, September 30 1934 (J. H. B. Lowe); imago taken, August 1936, and a good many larvae taken between 1936 and 1947 (A. M. Morley). Brook, larvae, 1956, 1957 (P. Cue).

10. Near Westerham* (see *First Record*).

11. Tunbridge Wells district* (M. M. Phipps and R. H. Ratray in Knipe, 1916). Aylesford, August 4 (1), 7 (1) 1955 (G. A. N. Davis).

12. Ham Street, one at m.v.l., July 1951 (C.-H.). Wye, one August 2 1955 (W. L. Rudland). Ashford Town, 1956, in garden (P.Cue).

14. Sandhurst, bred 1943, 1945 (G. V. Bull).

16. Folkestone Town, one, September 1 1949, one, August 20 1951 (Morley, *Ent. Rec.*, 64: 171); ♀ August 11 1956, ♀, August 21 1957, one, August 9 1959 (A. M. Morley). Morley told me he considered these were strays from the downs (C.-H.).

FIRST RECORD, 1809: *Phalaena unifasciata* Haw.; "Imago i Aug. sylvaticis prope Westerham in Cantio" (Haworth, *Lep. Britannica*, 2: 335). This is also the original reference to *unifasciata*.

[**P. blandiata** Denis & Schiffermüller; Pretty Pinion

Questionably Kentish.

This is the *Phalaena trigonata* of Haworth, 1809, who has: "Imago i Aug. Sepibus apud Westerham at rassime." "Exemplarium solum vide" (*Lepidoptera Britannica*, 344). Stephens (Haust., 3: 299) has: "Found near Westerham"; and Curtis (*Br. Ent.*, 623): "Beginning of August, Westerham, Kent". It would be interesting to know if Stephen's and Curtis's records were based on Haworth's sole occurrence, or whether the moth was found on more than one occasion near Westerham. That Haworth's example was *blandiata* I have no doubt, but I do question its origin since Haworth gives no clue to this and he was in the habit of accepting alleged Westerham insects from Plasted who was suspect (C.-H.).]

P. albulata Denis & Schiffermüller: Grass Rivulet.

Native. Chalk downs, railway banks, wet meadows, etc.; on *Rhinanthus crista-galli*.

1. Grove Park, fifteen, June 13, 1885, one, August 30, 1886 (Fenn, *Diary*). Lee (V.C.H., 1909). Bexley, abundant, 1900 (L. W. Newman, in *Wool. Surv.*, 1909); (L. T. Ford); by the Cray, a few, June 5, 1921 (Kidner, *Diary*). Petts Wood, 1951 (A. M. & F. A. Swain). Joydens Wood; West Wickham (de Worms, *Lond. Nat.*, 1956: 96). Farningham*, 1954 (A. S. Wheeler). Orpington, one, 1958 (R. G. Chatelain). Bromley, one, June 6, 1960 (D. R. M. Long).

4. Worth, taken by Mr Solly, June [1905] (R. A. Jackson, *Diary*, 26.i.1906). Marshes near Deal, four, June 12, 1905 (Stockwell, *Diary*). Deal*, seven, June 17, 1906 (Stockwell, *Diary*). Sandwich, one, June 4, 1911, in F. A. Small coll. (C.-H.); (E. & Y., 1949).

5. Chevening, May 25, 1912, May 16, 24, June 1, 1914 (Gillett, *Diary*). Biggin Hill (E. H. Wild); abundant May 17, 1952, and subsequently; full-grown larvae plentiful in seed-heads of *R. crista-galli*, July 27, 1971 (C.-H.).

6. Cuxton (Tutt, *Ent. Rec.*, 4: 229). Eynsford (W. A. Cope); (L. T. Ford); (de Worms, *loc. cit.*). Shoreham (W. A. Cope); (S. F. P. Blyth); several, May 21, 1933 (Kidner, *Diary*). Fawkham (E. J. Hare).

6a. Chattenden (Chaney, 1884-87).

7. Hills between Sittingbourne and Maidstone, "the fields are full of *E. albulata*" (1880) (Green, *Young Nat.*, 1 (34): 267). Hollingbourne (H. C. Huggins). Westwell (Scott, 1936).

8. Folkestone Warren (Knaggs, 1870). Folkestone, "swarmed", 1881 (Tugwell, *Entomologist*, 14: 215); 1892 (James, *Entomologist*, 26: 50); plentiful, June 19, 1910, at the foot of downs (Bell, *Ent. Rec.*, 22: 175); (A. M. Morley). Dover, 1883 (Coverdale, *Entomologist*, 16: 220); one, Elms Vale Bank, June 30, 1903, two, Elm Vale Slopes, June 14, 1905 (Stockwell, *Diary*); one, September 2, 1942, one, May 30, 1946 (B. O. C. Gardiner). Deal*, Ewell Minnis; Whinless Down (E. & Y., 1949). Brook* (C. A. W. Duffield).

10. Seal Chart, one, June 18, 1887 (Fenn, *Diary*). Sevenoaks, June 7, 1919 (Gillett, *Diary*). Brasted (R. M. Prideaux).

11. Watlington (V.C.H., 1908). Ightham Mote, (Morgan, *Lep. Tunbridge Wells Dist.*).

12. Lenham (H. C. Huggins).

13. Pembury (see *First Record*). Goudhurst, two, 1955 (W. V. D. Bolt). Bidborough (Morgan, *Lep. Tunbridge Wells Dist.*).

16. Folkestone, one in m.v. trap, June 1, 1952 (A. M. Morley).

FIRST RECORD, 1859: Pembury, common (Stainton, *Man.*, 2: 81).

P. flavofasciata Thunberg: Sandy Carpet.

Native. Woods, lanesides, railway banks, etc.; on *Melandrium album*.

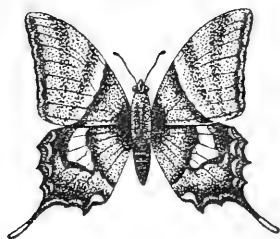
1. Lewisham (see *First Record*) Noted in many parts of this division since. Recently from: Shooters Hill Golf Course, one, June 11, 1947; Footscray, one, June 15, 1947 (J. F. Burton). Lewisham, on railway banks (D. F. Owen). Petts Wood, one, 1948, one, 1950 (E. Evans). Dartford, very common among campion (B. K. West). Joydens Wood (de Worms, *Lond. Nat.*, 1956: 95). Well Shave Wood, West Wickham, larvae in seed-heads of *M. album*, 1947, imagines reared May 1948; several imagines, June 30, 1954 (C.-H.). Bexley, 1952 (A. Heselden). Abbey Wood, 1953 (A. J. Showler). Blackheath, fairly rare, at street lamps, 1955 (A. A. Allen). Orpington, 1955 (L. W. Siggs). Bromley, two, June 16, 1959, one, June 16, 1965, one, August 15, 1966 (D. R. M. Long).

2. Dartford (B. K. West).
 3. Bysing Wood (H. C. Huggins). Clangate Wood, Sturry, May 28 (4), June 1 (4), 2 (1), 3 (1), 1932 (Busbridge, *Diary*). Ridgeway, July 25, 1933 (A. J. L. Bowes). Broad Oak, several, May 22, 1953 (C.-H.). Eddington, ♀, at light, May 26, 1953 (D. G. Marsh, *Diary*).
 4. Ickham, one, c. 1956 (D. G. Marsh). Sandwich Bay, July 24, 1967 (T. W. Harman).
 5. Green Street Green, 1898; Farnborough*, 1904 (W. Barnes, in *Wool. Surv.*, 1909). Farnborough* (de Worms, *Lond. Nat.*, 1956: 95). Westerham (R. C. Edwards). Downe (de Worms, *loc. cit.*). Chelsfield, 1950 (A. M. & F. A. Swain). Andrew's Wood, Shoreham, July 15, 1956 (C.-H.).
 6. Shoreham (Carr, *Entomologist*, 33: 47). Eynsford (Adkin, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1891: 122); (G. V. Bull). Gravesend (H. C. Huggins). Pinden (E. J. Hare). Farningham Road, one, June 26, 1964; Eynsford, one, July 14, 1964 (R. G. Chatelain).
 - 6a. Darenth Wood (Leigh, *Week. Ent.*, 2: 134); one, June 6, 1925 (F. T. Grant). Cobham, June 4, 1915 (F. T. Grant).
 7. Faversham; Sittingbourne (H. C. Huggins). Westwell, June 3, 1950 (E. Scott).
 8. Folkestone* (Ulyett, 1880). Brook* (C. A. W. Duffield); 1954 (P. Cue per E. Scott). Wye* (Scott, 1936). Chilham, June 10, 1951 (W. D. Bowden). Dover, singletons, May 5, 11, 1945 (B. O. C. Gardiner).
 9. Margate, common (H. C. Huggins).
 10. Brasted, a few in garden (R. M. Prideaux).
 11. Tonbridge (Raynor, *Entomologist*, 6: 74). Wateringbury; Yalding (V.C.H., 1908). Edenbridge, 1933 (F. D. Greenwood). Sevenoaks Weald, one, June 21, 1960 (E. A. Sadler).
 12. Kennington (Scott, 1936). Chartham (P. B. Wachter). Willesborough, two, May 25-30, 1954 (W. L. Rudland); one, 1957 (M. Singleton). West Ashford, common in an alder wood, May 1960 (M. Enfield).
 13. Tunbridge Wells (Knipe, 1916).
 14. Sandhurst (G. V. Bull).
 16. Near Hythe, common (Morley, 1931). Folkestone, one, June 1951, one, May 28, 1952 (A. M. Morley).
- FIRST RECORD, 1861: Lewisham (Fenn, *Diary*).

P. didymata L.: Twin-spot Carpet.

Native. Woods, copses; foodplant unknown. "Locally common" (V.C.H., 1908); to which I should add that in Kent it is mainly if not entirely a woodland species, with seemingly a preference for those woods that contain an abundance of *Anemone nemorosa* (C.-H.).

1. Dartford Heath (Jenner, *Week. Ent.*, 2: 197). Bostall Wood, 1862; Shooters Hill Wood, 1862; Eltham, 1864; Courtfield Wood, Erith, very common. 1884 (Fenn, *Lepidoptera Data* MS.); "Lee" (C. Fenn, in *Wool. Surv.*, 1909), may refer. Bexley district, rare (Newman, in *Wool. Surv.*, 1909). Farnborough* (W. Barnes, in *Wool. Surv.*, 1909). Bexley (Carr, *Entomologist*, 32: 40, 34: 108); 1911 (Kidner, *Diary*); (B. K. West). Sidcup, 1910, 1926 (Kidner, *Diary*). Chislehurst (S. F. P. Blyth). West Wickham, very common, 1926 (S. Wakely); 1950 (E. E. J. Trundell); plentiful in Well Wood, 1948 and since; plentiful very locally in Spring Park, 1970 (C.-H.).
3. Bysing Wood, common (H. C. Huggins). Den Grove, Sturry, 1939-40, abundant at dusk, July 13, 1941; Broad Oak, 1944 (C.-H.). Oldridge Wood



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Edited by S. N. A. JACOBS, F.R.E.S.

with the assistance of

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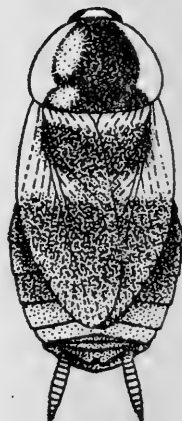
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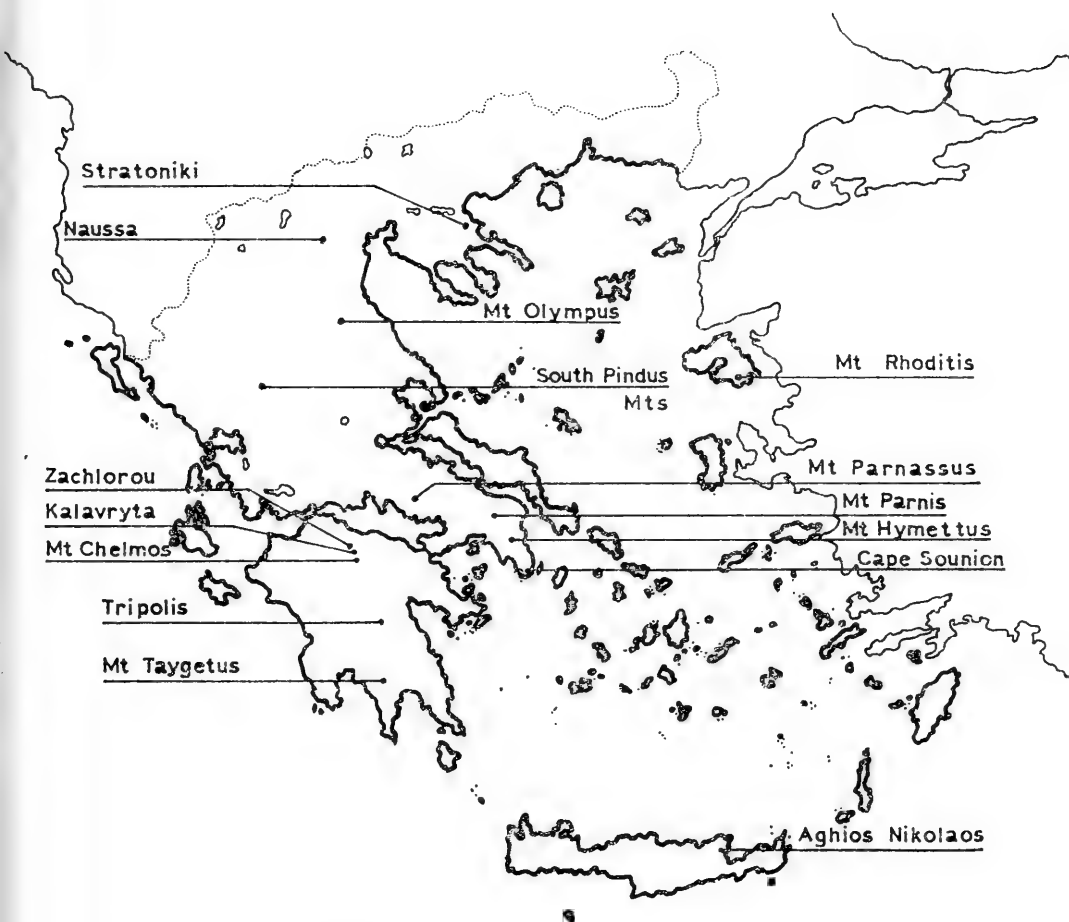
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List of Grecian Butterflies : Additional Records 1969-1971

By JOHN G. COUTSIS, B.A., M.Arch.



In 1969 I presented in the *Entomologist* (**102**: 264-268) a list of Grecian butterflies captured by myself in the years 1960-1969. The records now being listed represent additional species taken between 1969-1971.

Whenever necessary identifications were either confirmed or established by an examination of the male genitalia.

I am greatly indebted to Dr. L. G. Higgins for his invaluable help in matters of identification and nomenclature and to Prof. B. Kiortsis, of Athens University, for having put at my disposal the equipment used in preparing, studying and drawing the genitalia.

PAPILIONIDAE

1. *Allancastris cerisyi* Godt

April. 300-500 m., Mt Rhoditis, Lesbos island.

2. *Archon apollinus* Herbst.

April. 300-500 m., Mt Rhoditis, Lesbos island. Common in olive groves with lush undergrowth.

3. *Parnassius apollo* L.

July. 1400-1500 m., South Pindus Mts, Central Greece. Locally abundant. A large race, somewhat resembling sub-species *rhodopensis* Markovic, but with smaller red ocelli.

NYMPHALIDAE

4. *Brenthis hecate* Schiff.

July. 1400-1500 m., South Pindus Mts, Central Greece. Local and scarce; all specimens worn.

SATYRIDAE

5. *Hipparchia semele* L. ?ssp.

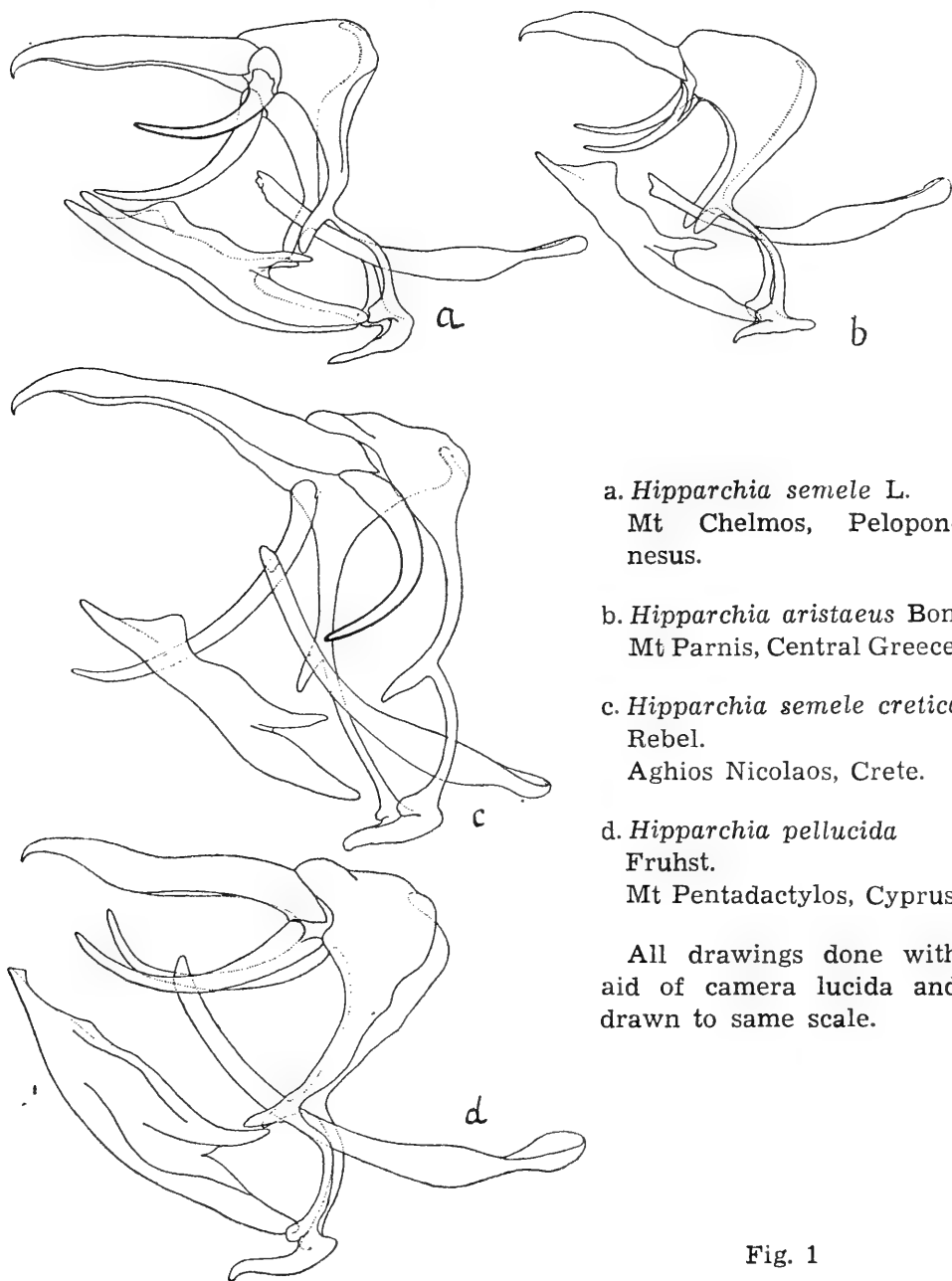
A single male captured June 15th, 1971, at 1350 m. on Mt. Chelmos, Peloponnesus. Identified by genitalia (Fig. 1a). Dr. Higgins has informed me that he has in his possession a male from Mt. Chelmos, June 25th, one from Naussa, Macedonia, July 31st, and one taken at Tripolis, Peloponnesus, August 27th.

The specimens from the Peloponnesus are relatively small and dark, with very little orange above, and they probably represent a definable subspecies.

Males of the superficially quite similar *Hipparchia aristaeus* Bon. have been taken by myself at the following localities and on the following dates: Cape Sounion, Attica, Central Greece, 24th May; Mt. Hymettus, c. 800 m, Attica, Central Greece, 27th May; Mt Parnassus, c. 1000 m., Central Greece, 22nd June; Mt. Parnis, c. 1000 m., Attica, Central Greece, 6th-15th June. Dr Higgins tells me that he has a male *aristaeus* taken at Tripolis, c. 1000 m., Peloponnesus, June 18th-20th.

The genitalia of male *semele* from the Peloponnesus are larger than those of Grecian *aristaeus* (Fig. 1b), and have different proportions. In *semele* the uncus and falces are relatively heavy and long, and the former is about equal in length to the valva. In *aristaeus* the uncus and falces are relatively weak and short and the former is decidedly shorter than the valva. In *semele* the falces extend downwards and distinctly outwards; in *aristaeus* they extend downwards and slightly outwards. The valva of *semele* is slightly longer than that of *aristaeus* and it has a longer distal ventral prominence.

The Cretan *Hipparchia semele cretica* Rebel has a genitalic structure (Fig. 1c) that differs from that of Peloponnesus *semele* by its considerably longer uncus and falces (both approximately $1\frac{1}{3}$ times longer), while the valvae are about equal in size and have a



a. *Hipparchia semele* L.
Mt Chelmos, Pelopon-
nesus.

b. *Hipparchia aristaeus* Bon.
Mt Parnis, Central Greece.

c. *Hipparchia semele cretica*
Rebel.
Aghios Nicolaos, Crete.

d. *Hipparchia pellucida*
Fruhst.
Mt Pentadactylos, Cyprus.

All drawings done with
aid of camera lucida and
drawn to same scale.

Fig. 1

similar shape.

The superficially similar *Hipparchia pellucida* Fruhst. from Cyprus has somewhat smaller male genitalia (Fig. 1d) than *cretica* and the valvae are shaped very differently, being heavier and broader and lacking the distal dorsal prominence. Anatomically *pellucida* from Cyprus seems to be the most differentiated species in this group, possessing valvae that seem unlike those of the other members of the genus *Hipparchia*.

6. *Aphantopus hyperantus* L.

June. 800 m., Mt Olympus, Northern Greece. Very local in wet places.

7. *Coenonympha leander* Esp *katarae* ssp. nov. (Fig. 2)

July. 1400-1500 m., near Katara Pass, South Pindus Mts., Central Greece.

Both sexes above similar to Bulgarian specimens of *leander*. Both sexes below distinguished from other known populations of *leander* by a regular and well defined white postmedian band on hindwings. Otherwise similar to Bulgarian specimens.

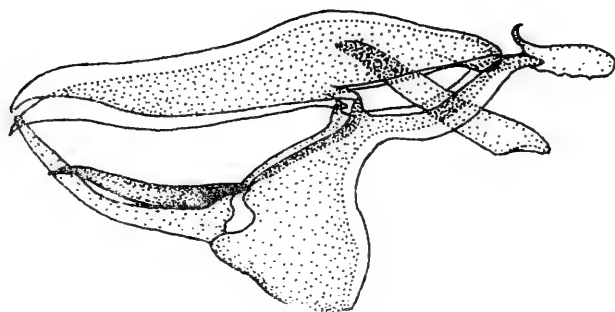


Fig. 3

Male genitalia (Fig. 3) seem to differ slightly from those of Bulgarian specimens by the somewhat more steeply domed tegumen.

Male Holotype, female Allotype, four male and one female Paratypes in author's collection. Two male and one female Paratypes in collection of Dr L. G. Higgins.

LYCAENIDAE

8. *Quercusia quercus* L.

June, July. 800-1400 m., Mt Parnassus and South Pindus Mts, Central Greece.

9. *Strymonidia w-album* Knoch.

July. 1100 m., South Pindus Mts, Central Greece.

10. *Heodes virgaureae* L.

July. 1400 m., South Pindus Mts, Central Greece.

11. *Heodes ottomanus* Lefbr

August. 500 m., Hills north of Stratoniki, Khalkidiki Peninsula, Northern Greece.

12. *Maculineaalcon* Schiff.

July. 1400 m., South Pindus Mts, Central Greece. A single male captured in 1971; probably a first record for Greece.

13. *Philotes bavius* Eversmann

June. 600 m., near Zachlorou, Peloponnesus. Singly; apparently quite rare.

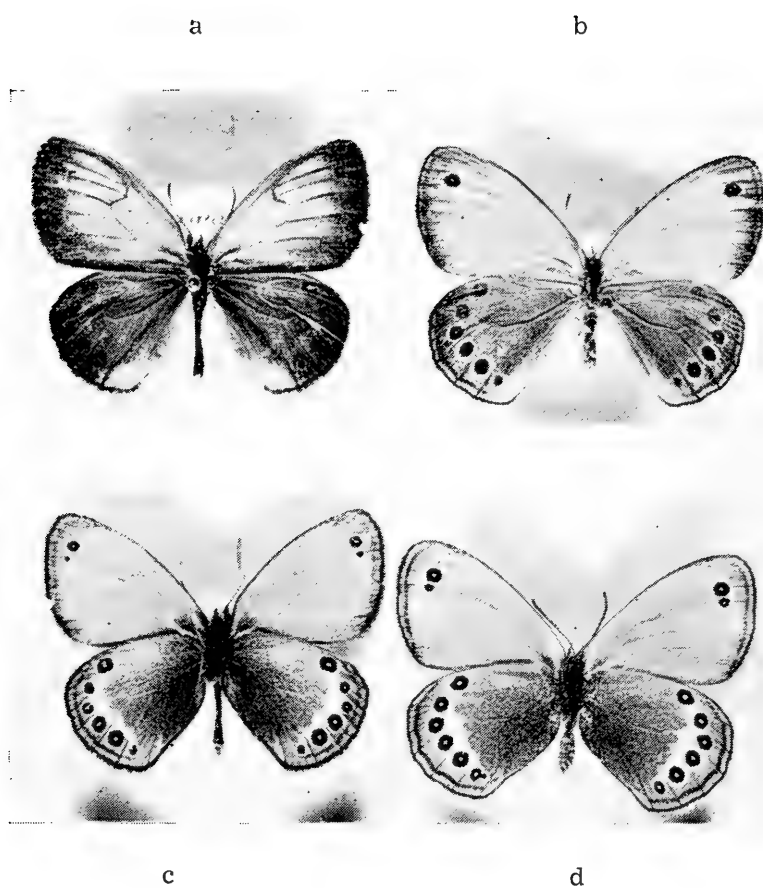


Fig. 2. *Coenonympha leander* Esp. *katarae* ssp. nov.

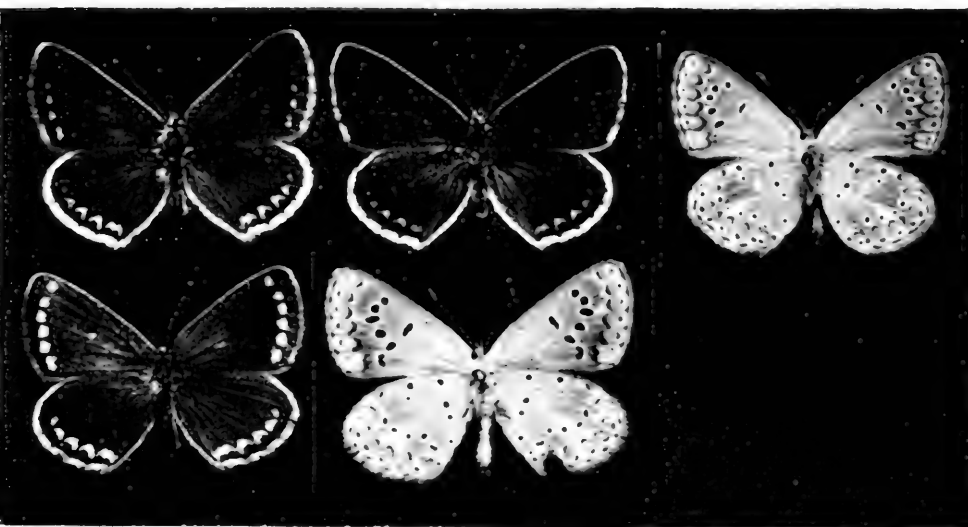
a. ♂ Holotype, b. ♀ Allotype, upperside.

c. ♂ Holotype, d. ♀ Allotype, underside.

PLATE VII

- a. *Aricia allous* ? *montensis* Vty. ♂ upperside Mt. Taygetus, Peloponnesus, c. 1400 m., 14.vi.
- b. *Aricia allous* ? *montensis* Vty. ♂ upperside Mt. Taygetus, Peloponnesus, c. 1400 m., 14.vi.
- c. *Aricia allous* ? *montensis* Vty. ♂ underside Mt. Taygetus, Peloponnesus, c. 1400 m., 14.vi.
- d. *Aricia allous* ? *montensis* Vty. ♀ upperside Mt. Taygetus, Peloponnesus, c. 1400 m., 14.vi.
- e. *Aricia allous* ? *montensis* Vty. ♀ underside Mt. Taygetus, Peloponnesus, c. 1400 m., 14.vi.

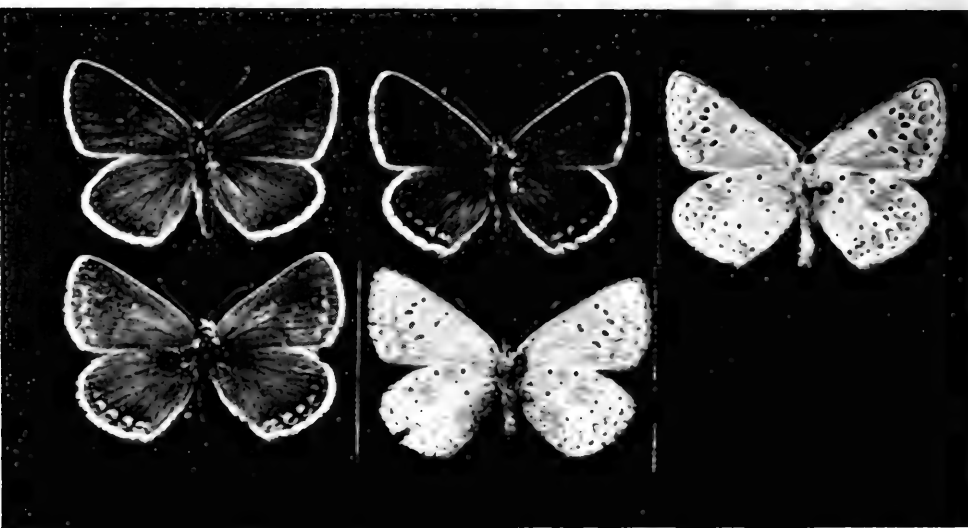
Fig. 4



a b c

d e

Fig. 5



a b c

d e

- a. *Aricia allous alpina* Stgr. ♂ upperside Mt. Parnassus, Central Greece, 1450 m., 26.vii.
- b. *Aricia allous alpina* Stgr. ♂ upperside Mt. Parnassus, Central Greece, 1450 m., 26.vii.
- c. *Agrodiaetus ripartii* Freyer ♂ underside, Mt. Chelmos, Peloponnesus, 1450 m., 26.vii.
- d. *Aricia allous alpina* Stgr. ♀ upperside Mt. Parnassus, Central Greece, 2000 m., 26.vii.
- e. *Aricia allous alpina* Stgr. ♀ underside Mt. Parnassus, Central Greece, 2000 m., 26.vii.

CORRECTED CAPTION FOR PLATE VII, FIG. 5

- a. *Aricia allous alpina* Stgr. ♂ upperside Mt. Parnassus, Central Greece,
1450 m., 26.vii.
- b. *Aricia allous alpina* Stgr. ♂ upperside Mt. Parnassus, Central Greece,
1450 m., 26.vii.
- c. *Aricia allous alpina* Stgr. ♂ underside Mt. Parnassus, Central Greece,
1450 m., 26.vii.
- d. *Aricia allous alpina* Stgr. ♀ upperside Mt. Parnassus, Central Greece,
2000 m., 26.vii.
- e. *Aricia allous alpina* Stgr. ♀ underside Mt. Parnassus, Central Greece,
2000 m., 26.vii.



14. *Aricia allous* Geyer ?ssp.

A small series of about a dozen males and four females (Fig. 4) taken near Langadha Pass, c. 1400 m., Mt. Taygetus, Peloponnesus, in June, in company with *Aricia agestis* Schiff.

Both sexes larger than *agestis* (Fig. 6).

Male: length of forewing 14·5-15·0 mm. Wings more pointed than *agestis*. Upperside darker brown than *agestis*. Black discoidal spot on forewings upperside less prominent than in *agestis*. Forewings above with at least some traces of orange lunules. Hindwings above usually with a complete row of orange lunules. Fringes of forewings above nearly always with some brown. Wings underside grey-brown but not quite as brown as second brood *agestis*. Orange lunules below almost as large as in *agestis* and equally brilliant as those of *agestis*.

Female: length of forewing 14·5-16·0 mm. Similar to male but with more rounded wings, a more often than not complete row of orange lunules above and a somewhat browner underside.

This population seems to bear a superficial resemblance to ssp. *montensis* Vty.

Specimens of *allous* taken on Mt. Parnassus (Fig. 6) at 1400-2000 m. together with *agestis* may be described as follows:

Both sexes larger than *agestis* but smaller than Mt. Taygetus *allous*.

Male: length of forewing 13·5-14·5 mm. Wings more pointed than Taygetus *allous*. Upperside as dark as *agestis* but black discoidal spot not as prominent as in *agestis*. Forewings above most often without any traces of orange lunules. Hindwings above usually - with an incomplete row of small and rather dull orange lunules. Fringes of forewings upperside nearly always pure white. Wings underside cold grey with a faint light brown tinge, orange lunules smaller and fainter than in both *agestis* and Taygetus *allous*.

Female: length of forewings 13·5-15·0 mm. Similar to male but wings more rounded, upperside most often with an incomplete row of dull orange lunules on both fore- and hindwings and underside browner. This population has been named by Staudinger ssp. *alpina* (Hor. Ent. Ross. 22: 305).

15. *Cyaniris helena* Stgr

May, June. 600-1500 m., Zachlorou, Kalavryta, Mt Chelmos, Mt Taygetus, Peloponnesus. May be locally abundant.

16. *Agrodiaetus coelestina* Eversmann

June. Mts of Peloponnesus. Confirmed by an examination of the male genitalia. Discovered as a new

Western European butterfly in 1971 by R. F. Brether-ton, L. G. Higgins, C. de Worms, and myself.

HESPERIIDAE

17. *Pyrgus alveus* Hbn.

July. 1100 m., South Pindus Mts, Central Greece. Identified by examination of male genitalia (Fig. 8a). A rather large and dark race. The genitalia of the superficially similar *Pyrgus armoricanus persica* Reverdin (Fig. 8b) are included for comparison.

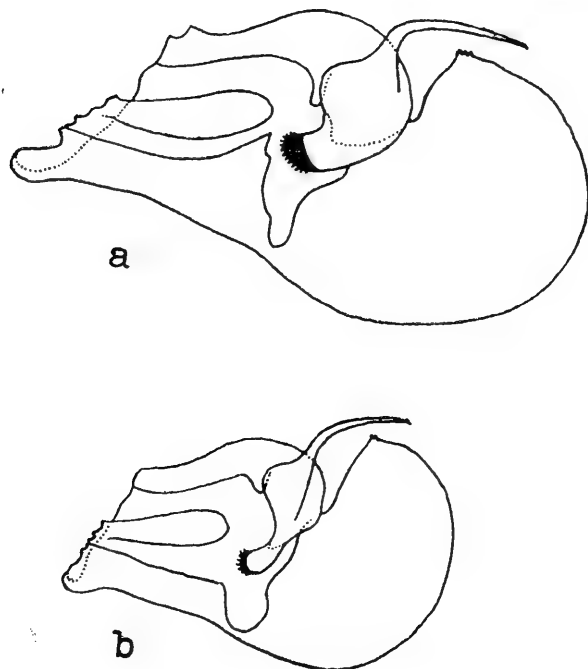


Fig. 8. a. *Pyrgus alveus* Hübn. Right valva. South Pindus Mts., Central Greece. b. *Pyrgus armoricanus persica* Reverdin. Right valva. South Pindus Mts, Central Greece. Both drawn to same scale with camera lucida

18. *Pyrgus sidae* Esp.

June, July. 1100-1500 m., South Pindus Mts., Central Greece. Not very abundant.

In conclusion I should also like to mention that about half the *Agrodiaetus ripartii* Freyer captured on Mt Chelmos lack the white streak on hindwings below (Fig. 7b), while the other half possess it in various degrees of clearness (Fig. 7c). Series caught on Taygetus and Parnassus do not exhibit this tendency. The often sympatric *Agrodiaetus admetus* Esp. (Fig. 7a) is always readily distinguishable from the unstreaked *ripartii* by the presence on the underside of both fore- and hindwings of faint but definable submarginal brownish lunules.

PLATE VIII

- a. *Aricia agestis* Schiff. ♂ upperside, Mt. Chelmos, Peloponnesus, 1400 m., 24.vii.
 b. *Aricia agestis* Schiff. ♂ upperside Zachlorou, Peloponnesus, 600 m., 5.vi.
 c. *Aricia agestis* Schiff. ♂ underside, Mt. Chelmos, Peloponnesus, 1400 m., 24.vii.
 d. *Aricia agestis* Schiff. ♀ upperside, Mt. Parnassus, Central Greece, 1800 m., 17.vii.
 e. *Aricia agestis* Schiff. ♀ underside, hills north of Stratoniki, Khalkidiki Peninsula, Northern Greece, 500 m., 2.viii.

Fig. 6

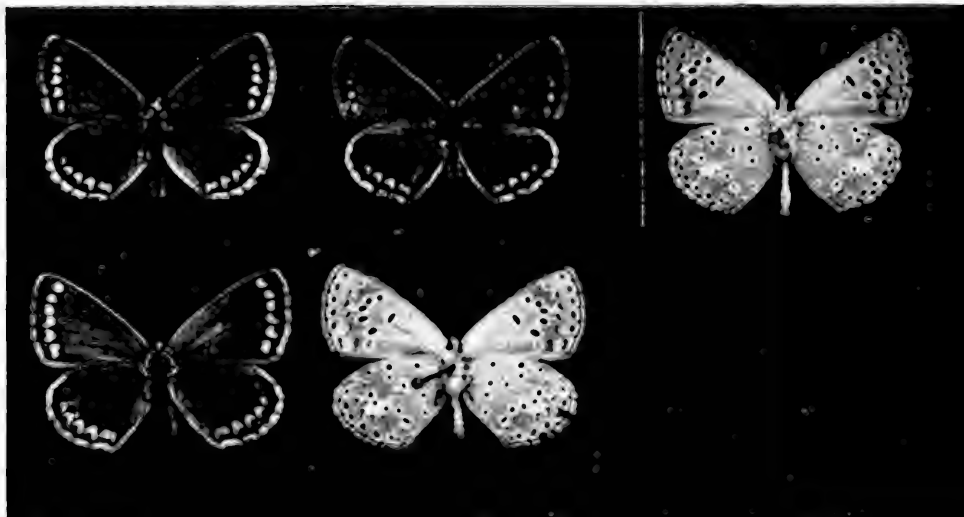
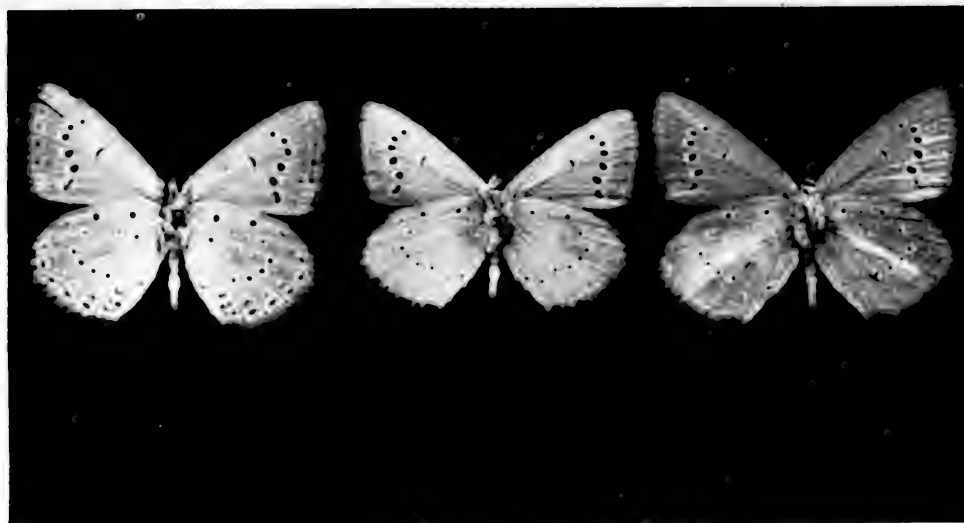


Fig. 7



- a. *Agrodiaetus admetus* Esp. ♂ underside, Mt. Taygetus, Peloponnesus, 1000 m., 18.vi.
 b. *Agrodiaetus ripartii* Freyer ♂ underside, Mt. Chelmos, Peloponnesus, 1400 m., 24.vii.
 c. *Agrodiaetus ripartii* Freyer ♂ underside, Mt. Chelmos, Peloponnesus, 1400 m., 24.vii.

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Lepidoptera Pursuit 1971

By DAVID BROWN

My moth season opened on February 3 with a most unusual species for such an early date, *Eupithecia nanata* Hübn. at rest on the dining room ceiling! The unusual place and time for this moth was explained by the presence of some heather which my mother had brought from Brockenhurst the previous summer.

My first outing of the year was to nearby Loxley Wood on the mild evening of 7th February. On searching the hawthorn shrubs and hedges with a torch *Theris rupicaparia* D. & Schiff. was very plentiful plus a single *Erannis marginaria* Fabr. Another visit to this wood on the 12th February produced the same species with the latter more common and a solitary *Phigalia pilosaria* D. & Schiff.

Another local wood at Ryton (more commonly referred to as

Princethorpe Woods) was visited on the 14th February and although a very strong wind prevailed the two blacklights produced five species of Macros including 2 *Erannis leucophaeria* D. & Schiff., 3 *Apocheima hispidaria* D. & Schiff and an early *Cerastis rubricosa* D. & Schiff. Conditions were excellent at this same wood on the 19th and I was very busy until my departure at 10.30 p.m. *A. hispidaria* was very common as was *P. Pilosaria* (Including 10 Melanic). Also 22 *E. leucophaeria* turned up with some nice forms.

On March 14 I spotted my first Butterfly of the year here at Charlecote—*Aglaia urticae* L. A visit to Oakley Wood on the sunny afternoon of March 20 resulted in the sighting of three *Archiearis parthenias* L. Another visit to Ryton Wood with the Heath traps on March 28 produced 14 different species. *Biston strataria* Hufn. and *Orthosia munda* D. & Schiff. were very common, together with a single *Achlyia flavicornis* L. the latter being common at Oakley Wood on April 4.

I had a nasty experience at Wappenbury Wood on April 6. While blacklighting I was rather alarmed by the roars and crashes of some unknown creature approaching rapidly through the undergrowth. Being on my own I lost little time in gathering my paraphernalia to make a rather hurried getaway! This experience in the darkness did not altogether encourage night collecting! Although I was to learn later from my friends that the noises came from muntjac deer.

On April 13 I journeyed over to the Wyre Forest, Worcestershire, my quarries being *Endromis versicolora* L. and *Orthosia miniosa* D. & Schiff., but I had no luck although *A. parthenias* L. was extremely common and specimens frequently came down to bask on a bright gravel track and were easily caught. That night also, blacklighting on the disused railway embankment near Bewdley proved fruitless, but *Polyplocia ridens* Fabr. and *Calostygia multistrigaris* Haw. were the best moths. I tried again for my target moths at the Wyre Forest on the 17th and 18th April but weather conditions were terrible and I abandoned my quest. Back in Warwickshire on May 11 blacklighting in Oakley Wood produced a few *Aethalura punctulata* D. & Schiff., *Drepana lacertinaria* L., *Lampropteryx suffumata* D. & Schiff. etc.

On May 22 I set off for the Wyre Forest once more. It was very pleasing to see *Argynnis euphrosyne* L. so exceptionally common. On this occasion I was kindly allowed to run my M.V. trap from the house where I was staying. The best moths caught were:—2 *Cerura vinula* L., 6 *Drymonia dodonaea* D. & Schiff., 2 *Apatele alni* L., 3 *Cosymbia porata* L. and *Lobophora halterata* Hufn. A heath trap placed further in the forest produced *Clostera curtula* L. and *Notodonta trepida* Esp.

On the wet afternoon of May 30 beating the herbage in Cubbington Wood near Leamington Spa produced *Scopula imutata* L., *Asthena albulata* Hufn., *Perizoma affinitata* Steph. and *Ectropis extersaria* Hübn. and the searching of tree trunks found *L. halterata* extremely plentiful.

I motored down to Brockenhurrt on 24th June and ran a heath trap at the top of Hollands Wood in a clearing bordered by ancient oak and beeches, on every night of my stay. The following were the best catches:—June 24—4 *Cybosia mesomella* L. and one *Boarmia roboraria* D. & Schiff., 25th June—*Moma alpium* Osbeck, June 26—*Sphinx ligustri* L., many *C. mesomella* L. and *Lithosia griseola* Hübn. (ab. *flava*). 27th June—1 *Bena fagana* Fabr., 2 *B. roboraria*, June 29—2 *Stauropus fagi* L. June 30—1 *S. ligustri*, 2 *B. roboraria*, July 3—1 *S. ligustri* L., 1 *Lithacodia fasciana* L.

At the camp lights throughout my stay *B. roboraria* and *Semiothisa alternata* D. & Schiff. were very common.

Disturbing the heather in the mosses and on the hills at Rhineland on 25th June produced *Chlorissa viridata* L., and numerous common species. In Hollands Wood *Argynnis selene* D. & Schiff. was quite abundant as was the day flying *Pseudopanthera macularia* L. and solitary specimens of *Epirrhoe rivata* Hübn. and *Cidaria fulvata* Forst. On the 29th June I watched *Macrothylacia rubi* L. dashing wildly about a heath near Lyndhurst. Attempts to net the mates proved a little too energetic! The following day however I found large batches of ova smothered on a wall. The resulting larvae are now hibernating in bulb fibre at home

A different part of Rhineland was searched on June 30 and a few hours of thrashing heather produced hundreds of *Diachrisia sannio* L. and singles of *Hadena contigua* D. & Schiff. and *Sterrha muricata* Hufn. Dusking at this spot on July 2 produced nothing of note except a freshly emerged female *Deilephila porcellus* L. at rest low down on the heather.

I made tracks for home on July 4 and en route called at a locality in Wiltshire and found *Panaxia dominula* L.

I was dismayed on a visit to local Tysoe to find the hillside covered with conifers, not only wiping out a strong colony of *Aphantopus hyperantus* L. in which ab. *caeca* and other nice forms were fairly frequent not so long ago, but also obscuring a wonderful panoramic view across this part of Warwickshire. On July 10 the blacklights in some damp woodland at Hasley Knob attracted 24 *Euphyia unangulata* Haw. and a single *Mysticoptera sexalisata* Retz.

July 15 found me in Cambridgeshire staying at Swaffam Prior. *Calostygia didymata* L. was very common in a nearby wood at dusk. The Heath trap that night produced 36 species of macros including *S. ligustri*, *Leucoma salicis* L., *Sterrha trigeminata* Haw. and *Perizoma flavofasciata* Thunbg. I was lucky to be allowed to run my M.V. trap at a local farm. On July 16 this produced a fine specimen of *Lophopteryx cucullina* D. & Schiff., 2 *Hadena conspersa* D. & Schiff. and 3 *H. bicolorata*. I visited Chippenham Fen on 17th but as my collecting permit had not arrived, I was unable to do any collecting there. It was surprising to find *S. ligustri* so very common here—in Warwickshire it is very rare. I searched the local part of Devil's Ditch on the 18th and cannot recall ever seeing *Maniola tithonus* L.

so plentiful. We had planned to return home on the 19th, but a blown gasket forced us to stay another night. The M.V. light on this bonus night attracted over 1000 moths comprising 65 different species including 2 *L. salicis*, *Heliophobus reticulata* Vill., *Unca trigemina* Werenberg and *Lygephila pastinum* Treits. The blacklight was operated on a small piece of marshy ground by a disused railway embankment. It attracted 45 different species the best being *Leucania obsoleta* Hübn. and *Perizoma sagittata* Fabr. These catches were adequate compensation for the breakdown.

Back in Warwickshire, the M.V. trap at Oakley Wood on July 24 produced a perfect specimen of *Rhyacia simulans* Hufn., also *Spaelotis ravidia* D. & Schiff., *Laspeyria flexula* D. & Schiff. and *Gastropacha quercifolia* L.

After over ten years of hard searching for *Celastrina argiolus* L. at Charlcote, I was surprised to spot a female of this species feeding on the bramble blossom provided for the purpose in my wild garden away to the rear of the house. Indeed this butterfly came into this vicinity in a big way for it was common and widespread throughout the summer. On July 28 I was further surprised to find a female *Argynnis aglaia* L. feeding on the garden *Buddleia*, this being another new species for the area. I journeyed over to Crickley, near Cheltenham, on July 29 and this provided a third surprise, for on this unusually late date a solitary *Parasemia plantaginis* L. was found at rest on a grass stem.

The M.V. trap at Hampton Lucy Wood in Warwickshire that night produced 2000 moths, including 12 *Laothoe populi* L., 3 *S. ravidia* and *Apamea ophiogramma* Esp.

On August 2 I was in North Wales staying near the village of Penbontfawr at a lovely isolated farm tucked away in the hills. The farmer was kindness itself and allowed me to plug in my M.V. trap each night. Moths were plentiful, but only two are worth mentioning *Lygris prunata* L. (August 2) and *Plusia bractea* D. & Schiff. (August 4).

I headed south again on August 19 and arrived at Lulworth shortly before dark, and set off immediately for the downs with my blacklight and sheet. It was as if there was a sudden rendezvous of *Noctua pronuba* L. on the sheet, for it was soon covered with them. Thirty-three other species were attracted that night including the local constable. My credentials having been approved, I stayed on to receive large numbers of *Harpyia furcula* Clerck and *Selidosema brunnearia* ssp. *scandinaviaria* Stgr. and a single *Lithosia complana* L. I operated the blacklight most nights on the downs overlooking the sea, and the only visitors of note were *Stilbia anomala* Haw. and *Plusia gracilis* Lempke. During sunshine hours, it was pleasing to see *Lysandra coridon* Poda and *L. bellargus* Rott. so plentiful. Curiously perched on a lamp post in Swanage I found a very fresh *Nonagria typhae* Thunb. during the evening of August 22. On August 26 I travelled east to the New Forest. Blacklight that evening produced *Scopula conjugata* Borkh. and

Lampropteryx otregiata Metcalfe. During this stay Mr L. W. Siggs kindly received me at Minstead and I was enchanted to look through his impressive collection and to hear his advice and experience.

Blacklight that night, August 28, produced *Asphalia diluta* D. & Schiff., *Drepana cultraria* Fabr. and *Paradiarsia glareosa* Esp. Sugar had at last produced *Catocala promissa* D. & Schiff. The following night was spent at Park Hill near Lyndhurst, where 5 lbs of sugar only produced a handful of common species. The blacklights produced a single *Orthonama lignata* Hübn. among 16 other common species. A further 1 lb. of sugar in Hollands Wood and another blacklight had produced little or any interest by 2.00 a.m.—a most disappointing night's (or morning's) collecting.

The night of September 1 once again found me in Ryton Wood where a single *Lymantria monacha* L. (a rare insect in Warwickshire) visited the blacklight together with a few *Trichiura crataegi* L.

My next trip was to Brindley Heath in Cannock Chase. Conditions were poor on 4th September with a very bright full moon. Only two moths visited my Heath trap—surprisingly both were *Lithomoia solidaginis* Hübn!

I arrived home on September 5 where I was received by *Mormo maura* L. fighting along the garden path in front of me. It seemed quite unbelievable that for the third time in successive years this species has been there to welcome me after a late summer's outing. It is otherwise a very elusive species in this vicinity. The following morning I spotted the first of a very few *Vanessa atalanta* L. that visited the garden this year.

Once again I ran my M.V. trap at Oakley Wood on September 14. About 1500 moths were counted, including *S. ravida*, 2 *Anchoscelis helvola* L., 14 *Cirrhia gilvago* D. & Schiff., 6 *Citria lutea* Strom., 35 *Cirrhia icteritia* Hufn., 4 *Gortyna flavago* D. & Schiff., 1 *Arenostola pygmina* Haw., 10 *Catocala nupta* L., *T. crataegi*, 6 *Deuteronomos alniaria* L., 4 *D. fuscantaria* Steph. and 2 *D. erosaria* D. & Schiff. The next night the trap at Hampton Lucy Wood had very similar results, but in addition were 8 *Dryobotodes eremita* Fabr.

On September 19, I had an interesting excursion to the borders of Oxfordshire and Buckinghamshire, mainly to locate *Techla betulae* L. It was most satisfying to find this insect in such splendid numbers, especially as I have experienced comparative scarcity in my local Warwickshire haunts despite finding it in two new areas recently.

My final outing of the year took me once again to Ryton Wood on the wet but mild evening of November 26. The herbage was covered with *Operophtera brumata* L., *Colotois pennaria*, *Erannis aurantiaria* Hübn. and *E. defoliaria* Clerck. The blacklight also produced these species plus half a dozen *Poecilocampa populi* L.

Charlecote, Warwickshire.

Mont Ventoux and the Dentelles de Montmirail 1968-1971

By L. McLEOD, B.Sc., F.R.E.S.

For the past five years my work as an agricultural entomologist has taken me to southern France for the months March to October. Three of these visits were spent investigating various pest problems in the Carpentras region of Vaucluse. This area is the centre of fruit and vegetable production in southern France. All orders of insects were exceptionally abundant and hardly a day passed when I wasn't busy with a net and camera at some time or other.

In his account of the Trans Alpine Insect Safari 1970, Thomson (1970) briefly mentioned his visit to Mont Ventoux. This account prompted me to write up some of my collecting experiences on Ventoux and in the surrounding area.

My favourite insects are the Rhopalocera to which I devoted the majority of my spare time, and I will restrict my account mainly to this group. However, like many other entomologists, I could not help but stray into the studies of other insect groups.

To the east of Carpentras lies Mont Ventoux, a mountain of 6273 ft. (1912 m) which rises abruptly from the Vaucluse Plateau, the broad Rhone Valley and Carpentras Plain. Ventoux lies on the extreme western edge of the Basses Alps and it was on and around this mountain that I concentrated my collecting and observing.

No-one can claim to know Provence if he has not looked down on it from the summit of Mont Ventoux. The panorama is superb especially on a clear day when it extends over a quarter of France. If one is lucky one can see the Italian Frontier (Alpes Maritimes, Dauphine, Savoie), to the Cevennes, the Lyonnais Mountains and the Pyrenees.

The vegetation ranges from typical mediterranean plants on the lower slopes to alpine flowers at the summit. On the flanks of the mountain are forests, the dominant trees of which are the Green Oak (*Quercus ilex* L) and the White Oak *Quercus lanuginosa* Lamk. Scots Pine Cedar, Beech, Firs and Larch occur up to 5250 ft.

My favourite collecting grounds were the grassy slopes just above the "Massif des Cedres" forest on the south facing side of the mountain. Here, the alpine insect species could be found together with many of the low altitude species.

The summit of the mountain is covered with limestone shale and from a distance the mountain appears to be capped with snow because of the reflection of the sun from the white stones.

The average difference in temperature between the summit and the plain is 12 degrees C. The annual rainfall at the summit is double that of the plain. Between December and the end of April snow is always present above 4250 ft,

The N 573 road ascends from Bedoin, 1017 ft., to the sum-

mit 6273 ft., in 14 miles and is well known throughout the western world for its arduous testing of cyclists in the Tour de France. It was here that the British cyclist, Simpson died in 1967.

In 1968 I made my headquarters in a delightful little hotel, the Auberge du Beffroi, in the village of Caromb. This hotel, recommended by a friend, turned out to be far beyond expectations for atmosphere, comfort and cuisine.

After my marriage in 1969, I decided to change from hotel accommodation to a private house. I moved my base to Gigondas, a mediaeval village situated on the western edge of the Dentelles de Montmirail, a range of jagged peaks which are the western extremities of Mont Ventoux. It was here that I spent the 1969 and 1970 seasons, living in a "Gite de France" or holiday house, overlooking the plain of the Ouvèze River and backed by the pine forests of the Dentelles.

Being resident in the area from March until October enabled me to observe and record much of the sequence of biological events during the majority of the insect season.

The earliest event of interest was the appearance of *Melitaea cinxia* L. larvae. These could be found feeding on plantains on the first sunny days of the year, sometimes even before the earliest butterflies were on the wing. I can only assume that this species overwinters in the larval stages. On a quick visit to Gigondas in March 1971, I found the ground swarming with these full-grown larvae while temperatures were still cool and only a week after snow had fallen. This was despite the exceptionally cold winter and heavy snow so unusual for Provence.

Even in years when winter continued later than usual, e.g. 1970 and 1971, several species of butterfly could be seen on the wing on the Carpentras Plain and lower slopes of Ventoux during the last week of March. *Vanessa Cardui* L. and *Pieris brassicae* L. were usually the first, followed by the brimstones *Gonopteryx cleopatra* L. and *G. rhamni* L.

In April the Southern Comma *Polygonia agea* Cr. could also be seen basking on old stone walls where the heat of the sunlight was trapped. This comma, unlike *P. c-album* L. appears to be an insect of the villages. I have found it common in both Gigondas and Caromb but have never seen it in open country. This observation has also been noted by Birkett (1964). *Aglaia urticae* L. could also be seen on road surfaces, which retain the warmth of the sun until early evening and are therefore attractive to this species during the spring.

The orange tips *Anthocaris cardamines* L. and *A. belia euphenoides* Stgr. also appeared during early April.

By mid April many more species had appeared and from this time until October, butterflies were abundant everywhere.

On one occasion I witnessed a butterfly migration in the area. This was at Sarrians on the 22nd and 23rd April 1970 when *V. cardui* L. were migrating in a north-easterly direction. The weather was sunny and hot, 27°C. with little or no wind. Flight was extremely rapid and at about 6 ft. above the

ground. A *cardui* passed me every 15 seconds and they would be traversing the road on average 5 yards apart.

These migrating *cardui* were difficult to net because of their speed and contrasted greatly with the occasional individual of the same species feeding on a flower. Perhaps the latter were of the local population and the migrating individuals were from Spain or even Africa. When caught, a migrating *cardui* would, on its release, fly off rapidly in the same NE direction. Unfortunately the migration was arrested by the Mistral, a very strong wind characteristic of the Rhone Valley, and no insects were flying for two days. After this time the migration had apparently passed.

Each year at about the end of April, fully developed larvae of the Garden Tiger Moth *Arctia caja* L. were often to be seen scurrying across the roads. Many hundreds must be killed when they "run the gauntlet" of traffic on a well-used road. This mortality can have little effect on the population which is sometimes so large that they become pests of many of the vegetable crops and vines grown in the area. Occasionally larvae of *Pharagmatobia caesarea* Goetz. could also be found on the roads but these were much less common.

Another victim of the roads was *Brintesia circe* Fab. In this instance it was adult butterflies which suffered because of their size. Smaller butterflies were swept aside unharmed by a passing car but I counted as many as thirty *circe* killed on a journey of twenty miles when driving at 50 mph. When multiplied by the number of vehicles the figure for total killed must be very high, but again this mortality appears to have little effect on the huge population.

Even in early May the snow had only just retreated from the higher slopes of Ventoux. The alpine pastures and rocky terrain above the forest line were still barren and brown. In June, *Parnassius apollo* L. were flying well and larvae could be found feeding on *Sedum*. This race ssp. *venaissimus* Frhst. is large and the ocelli vivid red, but specimens with orange ocelli and sometimes lacking one ocellus can occasionally be taken. This attractive butterfly could also be seen soaring and gliding on the steep slopes of the "Gorges de la Nesque," a most magnificent deep river valley reminiscent of the Cheddar Gorge in Somerset, but much more spectacular. These gorges are only ten miles from Ventoux and well worth a visit.

Mont Ventoux was at its best in late June and early July. Hundreds of flowers decorated the ground and some of the typically high altitude butterflies were to be seen. eg. *Parnassius apollo* L., *Papilio alexanor* Esp., *Melitaea diamina* Lang., *Erebia* spp., *Hipparchia alcyone* Schiff., *Satyrus actaea* Esp., *Satyrus ferula* Fab., *Minois dryas* Scop., *Heodes acciphron gordius* Sulz., *Coenonympha arcania darwiniana* Stdg.

At the end of July when conditions were very dry, Lycaenidae were attracted to moisture and on one occasion in 1969 in the Gorges de la Nesque, *Lycaena coridon* Poda occurred on every patch of moisture available to them. Even animal faeces were covered with these butterflies.

On the slopes above the forest line *Aporia crataegi* L. occurred every year in their thousands together with several species of Zygaenidae. These included *Zygaena purpuralis* Brunn., *Z. scabiosae* Esp., *Z. lonicerae* Schv., *Z. transalpina* Esp., *Z. filipendulae* L., *Z. carniolica* Scop., *Z. lavandulae* Esp., and *Z. trifolii* Esp.

Many species of fritillary also abounded here including *Mesoacidalia aglaja* L., *Fabriciana adippe* Schiff. and *Argynnis paphia* L. which could all be found feeding on clumps of the Red Valerian *Centranthus ruber* L. and Rosebay Willowherb *Epilobium angustifolium* L. Lower down the mountain they fed at flowers of blackberry and some of the larger thistles. *Brenthis daphne* Schiff. was also common at lower altitudes.

Three species of swallowtail occurred on the mountain. *Iphiclides podalirius* L., *Papilio machaon* L., and *P. alexanor* Esp. The last named was uncommon but the two former species were very common, especially *podalirius*, larvae of which could be found feeding on apricot and apple foliage in the cultivated areas of the Carpentras plain.

A large proportion of *Melanargia galathea* L. occurring on Ventoux were of the very dark form *procida* Herbst. In 1970 more than 50% of specimens taken above 4000 ft. were of this form. On the plain and lower slopes the normal form occurred.

Only twice have I recorded *Melanargia occitanica* Esp. Both occasions were in 1968. and perhaps by coincidence the two localities were both next to old chateaux: those of Chateauneuf-du-Pape and Le Barroux, the former being slightly outside the area under consideration but of sufficient interest to mention here. Although I searched thoroughly during 1969 and 1970, I failed to find a single specimen of this species.

From Malaucene a small road through Beaumont-de-Ventoux and Les Valettes brings one to a small valley situated at the northern side of the mountain. In this valley runs a stream bordered by large willow trees. Here I was surprised to find a colony of *Vanessa antiopa* L., a species usually uncommon in this area of Provence (Dufay 1965-1966). Again many species of fritillary were found including *Clossiana dia* L., and *Euphydryas aurinia provincialis* Bsd. *Zerinthia rumina australis* Esp. could also be taken on the wooded slopes. In May, some of the fields bordering the stream were filled with the flowers of wild narcissus and other meadow plants. Many Lycaenids and Hesperids were present, also the hawkmoths *Haemorrhagia tityus* Poda., *H. fuciformis* L. and *Macroglossum stellatarum* L.

Only a few yards from our house at Gigondas were the ruins of an old chateau. In the summer these ruins were floodlit every night and at weekends only during the remainder of the year. Two of the lamps were of the mercury vapour type and these provided convenient moth traps. I kept the grass trimmed around them and laid cotton sheets for easier capture of moths. As well as myself there was another who was also very keen on catching moths. He was an extremely large

toad, the largest I have ever seen. He arrived each night without fail to feed on the hundreds of insects attracted to the light. Perhaps the regular supply of unlimited food without any effort involved in its capture accounted for his large size.

Also present at the lamps were several praying mantids *Empusa pennata* Thun. These were several inches long, very narrow and possessed feathery antennae (♂). The mantids also gorged themselves each night on the abundance of insects. Perhaps they too were originally attracted to the lamps as were their prey. *Mantis religiosa* L. was also occasionally seen.

I will never forget the first occasion my wife and I saw the Giant Emperor Moth *Saturnia pyri* Schiff. Two of these moths were flying around a street lamp in Gigondas. They were so large that at first we thought that they were bats, but we realised their identity after stopping the car. They were too high to observe properly but the following morning, much to my wife's alarm and to my surprise, a large female *pyri* was resting on one of my shirts which had been left hanging on the washing line overnight.

Mont Ventoux and the Carpentras area are famous in the entomologist world because J. H. Fabre, the French entomologist, taught biology at the Carpentras High School. The modern lycée is named after him and not far away in the village of Serignan, his house and garden where he wrote his "Souvenirs Entomologiques," are open to the public. The insect collection on show leaves much to be desired and is greatly lacking in Lepidoptera, but a visit is well worthwhile. Fabre was very familiar with Mont Ventoux and its insects. In fact it is sometimes called "Fabre's Mountain".

Little has changed in the way of life in the small villages since Fabre's time. In the heat of the day, most of the villagers take a siesta after lunch. At this time I usually set out in a straw hat and shorts, armed with a net and camera. Cicadas sang incessantly in the trees. Large black *Xylocopid* bees buzzed from flower to flower together with large black and yellow *Scoli*id wasps. Hornets too, were frequently seen. These often nest in the small stone cabins dotted among the vineyards and farms.

On some afternoons when the sun blazed down, even the butterflies had to take shelter from its heat, and it was best to return to the coolness of the house or a deckchair in the shade, to write up notes. Even here the insect life was active. House flies attracted by a donkey which lived in a neighbour's cellar were numerous and very annoying when one dozed for five minutes. Bright metallic green chafers, *Cetonia aurata* L. flew to the vase of flowers on the windowledge. Small black scorpions could be found curled up under this vase every morning even though they were always ejected out of the window when found. On the garden wall, large green lizards skuttled from stone to stone.

In the early evening, swallows chased each other in circles

around the house until darkness came. Their place was then taken by bats who also seemed to enjoy their powers of flight. The incessant noise of the cicadas during the daytime was replaced by that of frogs, and glowworms lit up the garden walls.

Provence has a wonderfully unique atmosphere. The food, the wine, the history, and last but not least the insects and wild life, make this area of France more than attractive to me. One can live a peaceful tranquil existence away from the hustle and bustle of modern life and in a most pleasant climate. I look forward to returning to the area in 1972 and adding to my list of species and knowledge of Fabre's Mountain.

The following 117 butterfly species were taken during 1968-1971 on and around Mont Ventoux. The list does not constitute all butterfly species known to occur on the mountain.

PAPILIONIDAE

Papilio machaon L.
papilio alexanor Esp.

Iphiclides podalirius L.
Zerinthia rumina australis
Esp.
Parnassius apollo L.

PIERIDAE

Gonopteryx rhamni L.
Gonopteryx cleopatra europaea Vrtý.
Aporia crataegi L.
Colias australis Vrtý.
Colias crocea Geoff..
Colias hyale L.
Anthocaris belia euphenoides Stdgr.

Anthocaris cardamines L.
Euchloe ausonia crameri
Btl.
Pontia daplidice L..
Pieris napi L.
Pieris rapae L.
Pieris brassicae L.
Leptidea sinapis L.

LYCAENIDAE

Heodes tityrus tityrus Poda.
Heodes alciphron Rott.
Lycaena phlaeas L. f. *elea*
Fab.
Lampides boeticus L.
Everes argiades Pall.
Cupido minimus Fuess.
Celastrina argiolus L.
Philotes baton Berg.
Maculinea arion L.
Plebicula amanda Schn.
Plebicula dorylas Schiff.
Plebicula escheri Hueb.
Plebejus argus L.
Cyaniris semiargus Rott.
Polyommatus eros Ochs.
Polyommatus icarus Rott.

Lysandra coridon Poda
Lysandra amandus Sch.
Lysandra bellargus Rott.
Lysandra hispana H-Sch.
Agrodiaetus dolus dolus
Hb.
Agrodiaetus damon Schiff.
Agrodiaetus ripartii Frey.
Glaucopsyche alexis Poda.
Aricia allous Gey.
Callophrys rubi L.
Quercusia quercus L.
Nordmannia ilicis Esp.
Nordmannia acaciae Fab.
Nordmannia esculi Hb.
Strymonidia spini Schiff.

NYMPHALIDAE

Limenitis reducta Stdg.
Euphydryas aurinia provincialis Bsd.
Melitaea didyma meridionalis Stdg.
Melitaea cinxia L.
Melitaea diamina Lang.
Mellicta deione Gey.
Mellicta parthenoides Kef.
Mellicta athalia Rott.
Clossiana euphrosyne L.
Clossiana dia L.
Brenthis ino Rott.
Brenthis daphne Schiff.

SATYRIDAE

Pararge aegeria aegeria L.
Lasiomatta megaera megaera L.
Lasiomatta maera L. f.
adrasta Illig.
Lasiomatta petropolitana Fab.
Melanargia russiae cleanthe Bsd.
Melanargia galathea galathea L. + f. *procida*
Melanargia occitanica Esp.
Coenonympha arcania darwiniana Stdg.
Coenonympha dorus Esp.
Coenonympha pamphilus L.
Maniola jurtina hispulla Esp.
Pyronia bathseba pardilloi Sag.
Pyronia tithonus L.

HESPERIIDAE

Pyrgus fritillarius Poda.
Pyrgus foulquieri Obt.
Pyrgus malvae malvoides E. & E.
Erynnis tages L.
Gegenes pumilio Hoff.
Carcharodus lavatherae Esp.

NEMEOBIIDAE

Hamaeris lucina L.

Fabriciana adippe Schiff.
 + f. *cleodoxa* Och.
Mesoacidalia aglaja aglaja L.
Argynnis paphia paphia L.
Fabriciana niobe L.
 + f. *eris* Meig.
Issoria lathonia L.
Vanessa cardui L.
Vanessa atalanta L.
Polygonia egea Cr.
Polygonia c-album L.
Nymphalis antiopa L.
Nymphalis polychloros polychloros L.
Aglais urticae L.

Pyronia cecilia Vall.
Hyponephele lycaon Kuhn.
Satyrus ferula Fab.
Satyrus actaea Esp.
Brintesia circe Fab.
Minois dryas Scop.
Arethusana arethusa dentata Stdg.
Hipparchia fagi Scop.
Erebia meolans de Prunn.
Hipparchia alcyone Schiff.
Hipparchia statilinus Hufn.
Hipparchia semele cadmus Frhst.
Erebia ligea ligea L.
Erebia triaria de Prunn.
Erebia epistygne Hb.
Erebia scipio Bsd.
Erebia montana de Prunn.
Erebia neoridas Bsd.

Carcharodus alceae Esp.
Ochlodes venatus faunus Turati
Thymelicus sylvestris Poda.
Thymelicus acteon Rott.
Spialia sertorius Hoff.

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Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

THE BURREN PLUMES

I have read with much interest Mr Sadler's account in the January and February issues of his party's Burren trip and of their lack of success with *Platyptilia tesseradactyla* Treits. nec L. and *Aciptilia icterodactyla* Mann s/sp. *phillipsi* Huggins. Mr Sadler suggests that they were too early, from 20th May onwards, and this is certainly true as regards *icterodactyla*.

As regards *tesseradactyla*, the trouble was almost certainly the weather. The earliest Burren specimen in my series was taken on 29th May 1956, and I have seen it earlier. I have known this moth for well over fifty years, and except by one method, always found it rather difficult to get except on a calm warm afternoon, which is a rarity in the Burren in the last week of May and the first two in June. On such a day, and also in the early evening, it may be disturbed or occasionally seen flitting or seated on the flowers of the *Antennaria*. It is also in the habit, like many of its genus, of sitting on the flower-heads after dark, when it may be found with a torch.

P. ochrodactyla Hübn. has this same habit: there was, some forty years ago, a lot of tansy clumps on the Ludham road at the back of the old Ferry Hotel at Horning (destroyed by a bomb in the last war). I often stirred these up hoping for *ochrodactyla* without result, but one night in July 1923 I went there with a torch after dinner, about 10 p.m. and almost every flower-head had an *ochrodactyla*, the males just sitting there and the females with their ovipositors thrust deep into a flower. I expect road improvements have done away with all the tansy today.

Tesseradactyla is, or was, commoner locally in the Cookstown district of Tyrone, on the eskers than in the Burren, though at the moment I should not recommend anyone to look for it there, in Miss Devlin's constituency!

In 1938 my late friend Tom Greer took me to its locality near Lissane, on 8th June, the weather being dull, cold and miserable, we saw none. I suggested we should try again on the 9th which was even more wretched, and took my bee-smoker with me. We stirred the vegetation and saw nothing; I then got the smoker going under Greer's pitying eye, and fetched out at least 30 in an hour.

Tesseradactyla is widely spread in the Burren, and with a bee-smoker could, I think, be found anywhere there where the *Antennaria* grows. Of course both it and *icterodactyla* come to M.V.

Two of my own series, given to me about sixty years ago, were taken by Kane at Clonbrock and have been kept for that reason. My old mentor B. A. Bower had half a dozen given him by Kane from the same place. Clonbrock was quite a good locality, as a careful study of Kane's and Mr Baynes's books will show, as many quite scarce Irish insects were taken there by Kane himself. Praeger, annoyed by the futilities of Dillon and his gamekeeper, went much too far to the other extreme in condemning it.

I regret I could not find my way now to the Tyrone localities as I went in Greer's car and did not observe the road.

Icterodactyla was first found by the B.M. expedition at the end of July 1952. I went for it in July 1953 and found it in mid July in rather poor condition. However, it has a very long emergence period; 1953 was a very early year in the Burren and I found my first *Calamia tridens* Hufn. in very worn condition on 27th July, and on 31st July, when boxing *tridens*, near Ballyvaughan, I found a very large newly emerged female *icterodactyla* sitting on the grass. Further experience taught me that in a normal year it begins to emerge about the end of the third week in June; my earliest specimen is labelled 19th June 1956. If I were going especially for it I should go in the first week in July, and it is a nice easy thing to put up at any time of the day in reasonable weather.

I do not think the larva has yet been found in Ireland; I am certain it feeds on wild thyme, but when I went to find it or the pupa in early May 1956, I was suffering from a recently displaced cartilage, and after half an hour decided that if I kept on, it would ruin the whole trip.

The Irish *icterodactyla* is a distinct sub-species, quite unlike the southern European one. I dealt with this at length in The Entomologist's Gazette, 6: 124-6, and my types are at the British Museum.

I feel slightly envious of Mr Sadler and his friends in being able to run about in their cars visiting their M.V. traps: my own experiences for many years were of padding the hoof with what equipment I could carry on my back, and when after the war Ireland had settled down and I had a car, I could not drive because of a crippled hand, and my son, who acted as my chauffeur could not get away on holiday when I wished to go. I am not grumbling, even as late as 1956 I more than once walked from Ballynalachan to Fanore and back, and doubtless found a number of things I should have passed by in a car.

Identification of Common Fruitflies (Tephritidae : Diptera) of India

By V. C. KAPOOR

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Fruitflies are of great economic importance. They are serious pests of vegetables, fruits and ornamental plants. They lay eggs in living healthy plant tissue and the larvae feed in the stalks, leaves fruits and flower heads or seeds. In India fruitfly pests mainly belong to the sub-family Dacinae. A list of the host plants of Indian fruitflies has already been published by the another (1970).

A lot of taxonomic work is being undertaken on these flies in other countries while in India this group is largely neglected. Moreover, work relating to the identification of common fruitflies is not available at one place. Keeping in mind the needs of the field workers, easy keys are being provided for separation of the common species.

Collection

Fruitfly adults can be collected by insect net or by baiting. These should be immediately pinned and kept in the insect box. The specimens reared from infested vegetables and fruits must be kept alive at least for 4 days and fed on 25% honey from a cotton swab. The freshly emerged adults are soft-bodied and their wings are folded. They must be given time to expand their wings, harden their bodies and to develop colour so that it may be possible to identify them.

The specimens when preserved wet, must be kept in 70% alcohol. All specimens whether pinned or preserved in alcohol should carry appropriate label indicating name of the collector, host, locality, date etc.

To study the taxonomic characters more clearly it is always desirable to take dry specimens. The specimens preserved in alcohol can be mounted on pins employing the technique of Sabrosky (1966).

Identification

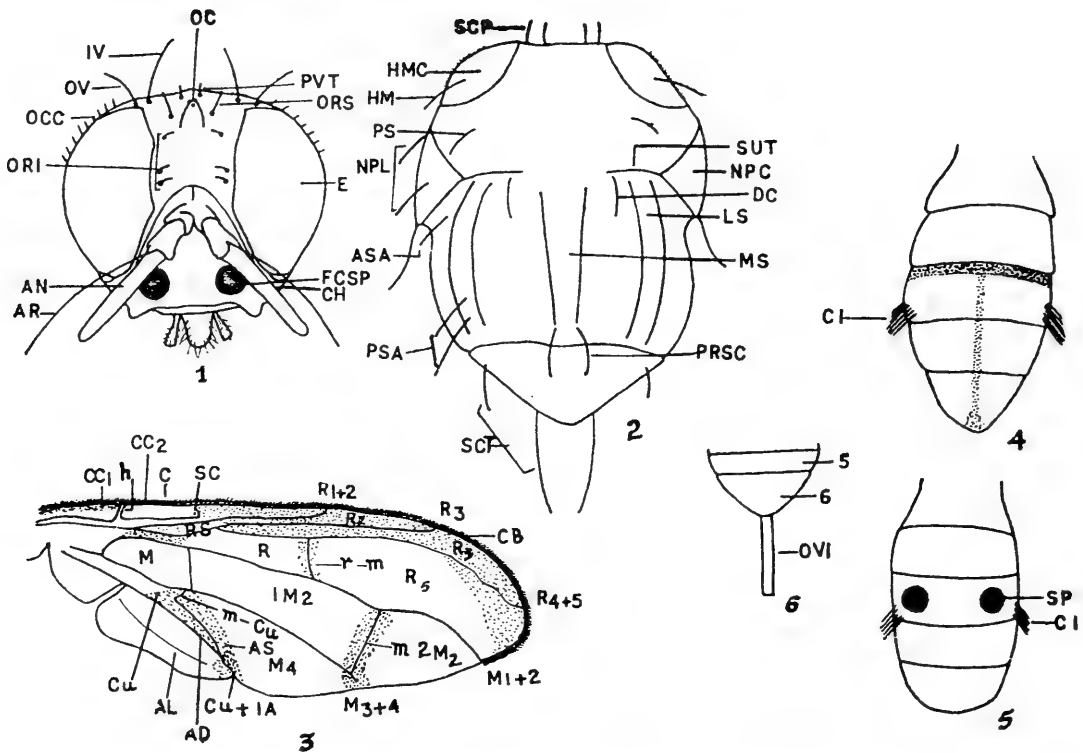
The identification of the species involve many characters but here only the important ones are given.

The family characters are presence of lower orbital bristles (fig. 1) and the subcosta is bent forward at approximately right angle and fading out before reaching costa (fig. 3).

Important characters used in identification

Head (fig. 1). The bristles are important in taxonomy. Cheeks broad or narrow. Face with or without brown or black spots which vary in shape. Antennae short or long; 1st and 2nd seg-

ments usually short, 3rd slightly or distinctly longer than broad and rounded or pointed apically.



Thorax (fig. 2). Dusty or dustless, with or without pubescence; here also the bristles are taxonomic characters. The anterior supra-alar bristle is inconspicuous. It is present on the side of the dorsum, a little in front of the root of the wings. Spots on the thorax are also important. A yellow lateral stripe is present on either side on the dorsum behind the suture and, sometimes a median one is also present; the scutellum is usually pale yellow sometimes provided with dark spots.

Abdomen (fig. 4). Dusty or dustless with or without pubescence; cylindrical or petiolated. The tergites may be free or fused; when free each tergite overlaps the preceding one and when "fused" (fig. 5) they are united firmly along their adjacent margins. Third tergite ciliated or non-ciliated. Ovipositor short or long (fig. 6).

Wings: Hyaline except the costal margin which may be narrow or broad, ending between $R4+5$ and $M1+2$ (fig. 3), apically the costal band may be broadly dilated; sometimes the costal band is very narrow and ends at or near $R1$ and in this case a small isolated dark spot usually present covering vein $R4+5$ at both ends. Anal stripe is narrow, wide, or absent; pale, black, or brown; extending from the cubital cell to the point of dilation of the cell or up to $Cu+IA$; the apical dilation of the Cubital cell may also be absent, the wings may be banded or reticulate i.e. dark ground colour with numerous rounded small hyaline spots.

A dark pale, brown, or black, narrow stripe may cover the cross-vein 'm' or $r+m$, also dark spot sometimes present in between the cell 'M' and base of the radial sector.

Dacinae

The fruitflies belonging to the subfamily Dacinae are serious pests of fruits and vegetables and occur throughout India. In India this subfamily is represented by three genera, of which *Dacus* Fb. is the most important.

The members of this group are medium to large sized; brown, ferrugineous, pale-yellow, or black. The chaetotaxy is reduced and the enlarged 2nd basal cell in the wing is important for separating the species.

Separation of species

- (A) Large sized; scutellar bristles 2 or 4; costal band broad and anal stripe well developed.
 - (a) Three pairs of lower orbital bristles and one pair of scutellar bristles; costal band broadly dilated at the apex; hind cross-veins thickly margined with brown *cucurbitae* (Cocquillet)
 - (b) Two pairs of lower orbitals and two pairs of scutellar bristles; costal band thick nearly of equal thickness throughout, hind cross veins not margined *tau* (Walker) = *hageni*
- (B) Small to medium -sized; scutellar bristles always 2; costal band narrow or incomplete; anal stripe narrow or absent.
 - (a) Tergites fused and look like a hemispherical capsule; anterior supra-alar bristles absent; oval black spot present on either side of 3rd tergite *ciliatus* (Loew)
 - (b) Tergites free; anterior supra-alars present; oval spots not present on 3rd tergite.
- (1) Costal band narrow, nearly of equal width up to the end; anal stripe narrow.
 - (i) Thorax greenish black, also with a yellow middle stripe; male without cilia on 3rd abdominal tergite; ovipositor very long and thin (fig. 6). *diversus* (Coquillett)
 - (ii) Thorax ferrugineous, without yellow middle stripe; male with cilia on 3rd abdominal tergite; ovipositor short and thick *dorsalis* (Hendel)
- (2) Costal band incomplete with an isolated spot at the end of the wing; anal stripe absent; pleural region with usual yellow markings.
 - (i) Body yellowish-red, facial spots rounded and always distinctly isolated; in ♀, ovipositor red but with black end; pale yellow band on third tergite *zonatus* (Saunders)
 - (ii) Body blackish-brown, facial spots very close to each other or more or less joined in the middle to form a transverse band; ovipositor red *correctus* (Bezzi)

Trypetinae

Chaetotaxy complete; wing with dark cross bands or spots, sometimes with hyaline incisions but never reticulate; 2nd basal cell small, 6th abdominal tergum shorter than 5th in the female, scapular bristles present.

Myiopardolis pardalina Bigot and *Carpomyia vesuviana* Costa are the most important and common species of this subfamily. The former is a serious pest of melons, while the latter is serious pest of *ber*. These can be easily identified as below.

Cheeks narrow; ocellar bristles absent; no median black line on thorax; two oval spots, very much approximated to each other, present posteriorly on scutellum; basal part of wing from cubital cell to one-third of 2nd costal cell black

C. vesuviana

Cheeks broad; ocellar bristles present; median longitudinal line on thorax present; only one medio-posterior axe-shaped spot with semi-circular posterior margin on scutellum; 1st costal cell and basal part of 1st basal cell hyaline

M. pardalina.

Tephritinae

Chaetotaxy complete; wing reticulate; 2nd basal cell small; 6th abdominal tergum as long as the 5th or longer, scapular bristles usually absent.

In this subfamily one species, *Acanthiophilus helianthi* Rossi is widely distributed in India. It is a serious pest of flower heads of the plants belonging to the family Compositae especially sunflower and safflowers. This species can be easily distinguished by the following characters:

Black; 3rd antennal segment pointed at the end; frons brownish-yellow, about one and a half times as long as broad; bristles black except yellow occipitals; thorax and abdomen with grey pubescence; dorso-central bristles just behind suture; wings hyaline except outer half tending to become reticulate and with rays apically (more distinct in ♂); ovipositor very long, basal three-fourth part provided with white hairs.

Acknowledgment

The author is grateful to Dr O. S. Bindra, Prof. & Head, Department of Zoology—Entomology for providing the facilities for this study.

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Abbreviations

A D—Apical dilation of cell Cu; A L—Axillary lobe; A N—Antenna; A R—Arista A S—Anal stripe; A S A—Anterior supra-alar bristle; C—

Costal vein; C B—Costal band; C C 1, C C 2—Costal cells 1, 2; C H—Cheeks; C I—Cilia; Cu—Cubital cell; Cu+I A—Cubital vein combined with first anal vein; D C—Dorso-central bristle; E—eye; F C S P—Facial spot; h—Humeral cross vein; H M—Humeral bristle; H M C—Humeral callus; I V—Inner vertical bristle; L S—lateral stripe; m—Medial cross vein; M (1+2; 3+4) Medial veins; M—2nd basal cell; 1 M 2—Discoidal cell; 2M₂—2nd posterior cell; M₃—3rd posterior cell; m—cu—Medial-cubitus cross vein; M S—Median stripe; N P C—Notopleural callus; N P L—Notopleural bristles; O C—Ocelli; O C C—Occipital bristles; O R I—Inferior orbital or lower orbital bristles; O R S—Superior orbital or upper orbital bristles; O V—Outer vertical bristles; O V I—Ovipositor; P R S C—Prescutellar bristles; P S—Praesutural bristle; P S A—Posterior supra-alar bristles; P V T—Postvertical bristles R(1; 2+3; 4+5)—Radial veins; R—1st basal cell; R₂—Marginal cell; R₃—Submarginal cell; R₅—1st posterior cell (inside wing); r—m—Radio-medial cross vein; R S—Radial sector; S C—Subcostal vein; S C P—Scapular bristles; S C T—Scutellar bristles; S P—Spot; S U T—Suture.

Notes and Observations

BREEDING EUROIS OCCULTA L. THE GREAT BROCADE.—Although some species which hibernate as larvae are quite easy to breed, others seem to be difficult and casualties are often heavy.

On the 15th August 1971 Mr R. F. Bretherton gave me 42 ova of that fine moth *E. occulta* L., the great brocade, from a female taken in Scotland. These hatched the same day and began feeding quite freely on willow and birch. They were kept indoors in a warm room. Growth however was extremely slow, except for one larva which grew very rapidly and was soon many times the size of the others.

On the 6th November this larva pupated, the remainder (38 in all now) still being very small.

By now birch and willow were almost unobtainable and I had the choice of allowing them to go into hibernation or of trying more drastic methods. I, therefore, switched the food plant to bramble and kept the larvae very close to a radiator where the temperature was 65° to 70° by day and 55° by night. They were kept in plastic sandwich boxes, initially 12 to a box and later 6, the boxes being well lined with tissue changed daily.

This atmosphere clearly suited the larvae as they began to grow rapidly, though at very varying rates. There were, however, occasional casualties.

On the 18th December a moth emerged from the larva which had pupated on 6th November. A number of other larvae were now almost full fed and the second and third pupated on 28th and 31st December respectively.

From then onwards further larvae pupated at intervals of a few days the last doing so on 27th January 1972, when four rather sickly larvae were still feeding. All these died during February.

Moths emerged from 4th February until the last on 6th March when I had in all 23 moths from the original 42 eggs, all are perfect full sized specimens.

All the larvae chose to pupate in folds of tissues, seeming to prefer this to anything else.

Pupation was therefore spread over a period from 6th November until 27th January, and emergence from 18th December until 6th March.—J. A. C. GREENWOOD, The Thatches, Forest Road, Pyrford, Woking, Surrey. 26.iv.1972.

THE INHABITANTS OF OAK APPLES.—To complete my account of the rearing of insects from oak-apple galls (*Ent. Record*, 83: 391) I must add that the Chalcid parasites overwintering as larvae emerged in the last two weeks of March and the first week of April. They were all of the species *Olynx skianeuros* (Ratzeburg) (Eulophidae), 24 females and 19 males.—A. E. LE GROS, 155 Glenfarg Road, Catford, London SE6 1XW. 15.iv.1972.

BLASTOBASIS DECLORELLA WOLLASTON IN KENT.—The note on this species by E. S. Bradford (*antea*: 25) was of special interest to me as I was engaged in conversations about that species with Mr S. Wakely at the time the note was published. The main topics of the conversations were the large increase in the numbers of the species at light in my house at Orpington over the past four years, and the appearance there of only obviously recently emerged individuals in perfect condition from 25th November to 15th December 1971. In previous years I had noted the species in two broods only, viz. in June and July and in September and October. Mr Wakely told me that he had received reports that the species is now widespread, that he had observed it in profusion in reed beds in Norfolk, and that in his view my November and December 1971 visitors represented a third brood. It thus appears that in suitable climatic conditions—the autumn of 1971 was propitious in this respect—this almost certainly introduced species can be many-brooded and that Meyrick's prediction in his Revised Handbook of British Lepidoptera that members of this family in addition to *B. lignea* Walsingham and *Auximobasis normalis* Meyrick, has again proved to be well founded.

I first recorded *decolorella* from Orpington in 1965. It was uncommon there at the time, and I doubt whether it occurred there earlier as it was not among the species contained in my local collection of the larger micros which came to light, which Mr Wakely had so kindly named for me a few years earlier.—F. A. SWAIN, 17 Ridgeway Crescent, Orpington, Kent. 8.v.1972.

EARLY SPRING BUTTERFLIES, 1972.—On 16th April, a gloriously sunny day, I saw in the chalkpit at High Down, near Worthing, the home of Lady Stern, the Small White (*Pieris rapae* L.), the Orange Tip (*Anthocharis cardamines* L.) and the Holly Blue

(*Celastrina argiolus* L.) quite an early date for these species.—
C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 19.iv.1972.

Current Literature

Butterflies of the Australian Region by **Bernard d'Abrera**
F.R.E.S. Lansdowne Press Pty. Ltd. Large 4to 405 pp.
£15.00 (E. W. Classey Ltd., distributors).

The advances made in colour photography and printing resulted in the production of many "picture books" of insects, and although some beautiful insect photography was printed, many of them were no more than that. One or two were produced by highly reputable entomologists, and dealt with the subject of entomology broadly, and so were of great use for instruction; the others, as I have said, were but picture books. It caused me some considerable distress that such beautiful work and the outlay of so much money could be made to include more detailed systematic work.

In the work under discussion, it seems that the author has been able to marry the appreciation of beautiful colour work with scientific usefulness, greatly to the advantage of scientific entomology.

He commences with a short foreword in which he explains the absence of keys by pointing out that these would confuse the non-scientific reader, and would render the work prolix, while the coloured figures would give detail to the scientific reader to enable him to identify material with reasonable certainty. He also points out that species of which no suitable specimen could be found for photographic purposes are compared with a closely allied species to assist in identification.

In his acknowledgements he gives full credit to those who have assisted him, in both senior and junior capacities, in his preparatory work of research and photography. He points out that where they have been suitable for photography, type specimens have been selected for illustration. These are marked with a red dot for types, and the customary yellow ring for paratypes.

A page of "Some Notes for the Guidance of the Reader" explains the general layout pattern of the text, and explains abbreviations used. The various sub-regions composing "the Australian Region" are also explained clearly in very few words, with maps of Australia, and of the Pacific Isles concerned in the area, to illustrate the point. There follows a survey of the butterfly's place in nature, explaining the differences between butterflies and moths. The structure of the imago, its diet, respiration, circulation, venation, senses and habits, metamorphosis are all shortly mentioned. Two pages are then devoted to mimicry and protective resemblance, another to variation, and another to nomenclature; in this the author stresses the advantage of using scientific names

and explains their structure and universal application (in spite of periodical necessary changes).

In explaining classification, the author divides the Lepidoptera into the three super-families of Hesperioidea, Rhopalocera and Heterocera, and points out that the present work deals only with the Rhopalocera.

There follows an interesting account of the study of Australian entomology, with portraits of several entomologists concerned in its development, and notes on their personal efforts. A glossary of terms used completes the introductory section, which is illustrated throughout by colour and half tone photographs appropriate to the pages on which they appear.

The systematic text of the book now commences, each family is introduced by a note giving details of its main features, faced usually by a greatly enlarged photograph of a more or less typical species of that family. The following pages deal with the genera, species at the side of the relative illustrations. The illustrations are laid out in the manner of a collection. The bare relative details are given, the idea being that the marvellous illustrations should supply the description. Where possible, the upper and undersides of both male and female are shown. Sometimes, coloured photographs of early stages also accompany the imagines. This laying out of the figures in the manner of a collection, and not in crowded "plates" renders comparison with specimens very much easier and more satisfactory.

After the main text, five pages of selected bibliography, a page of corrigenda, and an index conclude the book. The author is to be congratulated on the skill and patience used in the preparation of the photographs, and this has been backed up by the makers of the colour sets and the printers who have brought them into being in the book. The production team is mentioned on the fly leaf, and the highest congratulations are due to all concerned.

The book is printed on art paper and bound in cloth boards with gilt lettering on the spine, and will make a handsome addition to the collections of all lovers of beautiful books, and a very important addition to the bookshelves of those, amateur or professional, interested in the butterflies of the South Pacific. In these days of air travel, the book will also be a pleasant reminder to those interested in natural history, who have visited the area.—S.N.A.J.

Australian Butterflies by **Charles McCubbin**, large 4to, xxx+206 pp. Nelson (E. W. Classey Ltd., Distributors) £12.50.

In a foreword the Rt. Hon. Sir Robert Menzies gives a short account of the McCubbin family and its history of combining their painting with various aspects of nature.

After a list of contents, the acknowledgements show this book to be practically exclusively an Australian effort. In his preface, the author explains certain matters of arrangement of

species and genera, some of which may seem out of place in the book. These were delayed owing to his not having the material for drawing at a time when the other material was ready for printing, and were added as soon as they could be completed. He also explains the difficulties experienced in identifying food plants before they were in flower or fruit, pointing out that he has illustrated these plants as he found them, which should help the reader to obviate some of the difficulties which he himself had experienced.

In his Introduction, the author has gone to some trouble to explain the origin of nomenclature, and the great advantage of adhering to the scientific names rather than using vernacular names. He then explains in outline the division of insects into orders, families and species. After explaining the various kinds of Type specimens, a view of the Insect World occupies two pages, their main characters being mentioned, with a line drawing of a representative of each order mentioned.

The division of the Lepidoptera is then explained, followed by an outline of the structure of insects, working up to the butterflies whose wing venation is explained. Life history follows, and finally notes on collecting, and anybody contemplating an expedition to collect Australian butterflies would do well to read these notes carefully. Killing, relaxing, setting and storing complete the Introduction with a page of illustrations of net making, storage papers, and setting.

The main treatise follows, lavishly illustrated by the author's beautiful drawings of the insects, embellished in many cases by equally fine drawings of their food plant and a background of entrancing sketches of various aspects of Australian life in the particular district favoured by the insect under discussion. On the plates, each insect is named, with the number of the page on which it is described added.

The text deals systematically with the family, noting its main characters, then dealing similarly with each sub-family and the genera in each follow with descriptions of the species, and sub-species where they exist, and their distribution and habits. All the species known from Australia and Tasmania are included, and with the exceptions mentioned earlier, they are arranged working down from the most highly specialised to the most primitive.

After the species have been treated, there is a double page map of Australia followed by a list of localities mentioned with a grid reference to each. Fourteen pages of bibliography follow and finally there are indices of butterflies and of plants.

The book is printed on art paper and bound in strong buckram with gilt lettering on the spine. The type is good and clear, and in the treatise, the descriptive matter is printed in two columns, thus avoiding the subject of my only adverse criticism: the long lines of the Introduction pages are not easy to read without the use of a straight edge.

To any book lover this book would make a very desirable

addition to his library, but to the collector of Australian butterflies it is indispensable, the information supplied together with the foodplant drawings surpassing anything else available to him. The artistic presentation must appeal to everyone. The artist has taken no liberties with nature, and if his model were chipped, those chips appear in his drawing, without any guessing as to the nature of the missing parts, and the colour work has been excellently reproduced by the printers.—S.N.A.J.

The appearance of these two books at the same time might prompt one to ask why such a thing should happen, but on further consideration one is impressed by their differences in the handling of the subject. The texts of both are scientifically accurate, but I would liken *The Butterflies of the Australian Region* to a more easily transported museum collection for the identification and study of the species, while *Australian Butterflies* is more for the field collector; it is of course not portable on his expeditions, but is most useful both before setting out and on returning home from an expedition. The inclusion of the Hesperioidea gives it an advantage over the *Australian Region* book, but their inclusion for a so much wider area would have enlarged that book to unwieldy proportions. Ideally, I would suggest both books, but even in these affluent days, the cost might be considered too much, so failing this, to the collector I would recommend *Butterflies of the Australian Region*, and to the field worker *Australian Butterflies*, but I do repeat both if at all possible.—S.N.A.J.

The Desert Locust by Stanley Bacon, xiv+228+16 pl. Eyre Methuen, London, £3.50.

The author of this book is a journalist with a strong interest in entomology who has been working with F.A.O. He has written in a way that should interest both the student and the intelligent layman.

His first chapter follows the desert locust through history from biblical days, with even earlier mentions, up to the present day. Chapter 2 cites the desert locust as an international enemy. The life cycle is dealt with in chapter 3 and chapter 4 deals with the strange "phase change" when the insect changes from a solitary life to a gregarious one. From then on, the author describes his journey through the Sahara area to make a survey of the locust population, a difficult matter in its solitary phase. His experiences in various parts of this journey are written up vividly and he carries the reader's interest wherever he goes. The final chapters deal with "The Future" and "Methods and Morals" discuss the advantages and disadvantages of various control methods.

The main illustrations are photographic, with distribution maps and maps showing migration patterns. The book is printed on good paper and bound in cloth boards.

Whereas the scientific accounts of locust control projects

are obviously works of reference, I take it that the present book is for reading by those interested in the subject though not actually working on locust control. It must, however, prove to be of great interest also to the more scientific, if only to feel how the less scientific feel towards the matter. I say again, it is a most interesting book to read.—S.N.A.J.

Obituary

Colonel H. G. T. Rossel, known to his many friends as Chris, died at Fowey on 10th December, 1971, after a year of increasingly poor health. He was 77. Educated at Felsted and Sandhurst, he was commissioned into the Indian Army in 1915, and served in Mesopotamia during the first world war. Between the wars he spent much of his time on Departmental work on the North West Frontier, and at the beginning of the second war he raised and trained a battalion of Engineers in Ceylon, later serving throughout the war in Burma. He was mentioned in Despatches in both wars. After being invalided out of the service in 1946, he came to live in Cornwall, at Bodinnick, where his charming house overlooked the estuary of the river Fowey. Many a good moth took this route into England, and his most noteworthy capture was the only specimen of *Perigea conducta*, a North African Noctuid, ever to have been recorded in Britain. Other visitors to the mercury vapour lamp at Bodinnick were *H. celerio*, *U. pulchella*, *L. loreyi* and several of the very rare *Plusiid* species. As a raconteur, Chris Rossel was unsurpassed. He used to tell of a holidaymaker, crossing the river by ferry one evening, who noticed the light of the lamp on the hillside. The ferryman's reply to his enquiry about it was "Oh, that's the Colonel's moth lamp." To which the irate answer was "My God, you Cornish are *all* the same — I can never get a word of truth out of any of you!" Chris Rossel's interest in Lepidoptera began as a schoolboy. His collection contained many species from Burma, India and Ceylon, in addition to those taken in this country. More recently he made some trips to the Continent, and his knowledge of the European butterfly species was considerable. He loved his garden, steep and difficult to cultivate as parts of it were, and he had 'green fingers.'

Chris Rossel had a decidedly military appearance, with small clipped moustache, shortish light hair, fresh complexion, and was about "average" height. In spite of a troublesome leg (the cause of his being invalided out of the Army) his bearing matched his appearance. But his friends will remember him above all for his personality, which was a mixture of great good humour, courtesy and generosity. He was also extremely modest about his achievements, which included a fine series of watercolours painted over the years in India, and many hundreds of feet of superb film of animals in their jungle surrounding. On one occasion he had been left on his own near

a remote pond in the Ceylon jungle, in order to photograph such animals as came along. After he had been there some time, and had taken several photographs, there was a sudden snapping of branches above him, and a large leopard landed on the groundsheet beside him. It snarled in his face, then turned round and ran off. He believed that the leopard had been quietly stalking him, and until the last moment had been under the impression that he was some new sort of khaki deer. On the subject of snarling, one of his favourite recollections was of a taxidermist in Calcutta, whose advertisement ran "Let us have your trophies. We will mount them expertly, snarling in English style." After pitching camp one day in Burma, he went to collect the local butterflies, taking with him his old bearded shikari, Mohammed Khan. The latter had not seen a lepidopterist in action before, and followed in a mystified manner. At last light dawned, and he exclaimed "Ah, Sahib, *now* I understand — it is a form of shikar after all. You *are* killing something.

Chris Rossel's first wife, Connie, died in 1959 after a long illness, through which he nursed her devotedly. Subsequently he was on his own for many years, but in spite of this his hospitality was unbounded. Even after returning from moth-ing well into the small hours, he would be up in good time to cook breakfast for his guests. He will be greatly missed, and to his second wife, Jean, whom he married only a few years before his death, but who brought him such happiness, goes our deepest sympathy.

F.H.N.S.

Current Note

After more than twenty years of his very active help to The Record, in managing the advertisement pages and cover material, Mr F. W. Byers has decided that it is now time that he retired and handed his work over to a younger man, on account of the increasing demands of his domestic life.

We cannot allow him to go without expressing our very deep appreciation of the work which he has done for so long, and which has often made the difference between The Record paying its way and incurring a loss.

It will be remembered that on the death of our treasurer Leonard Parmenter, he also carried on the work of treasurer until a replacement could be found.

Mr Byers's place will be taken by Dr I. A. Watkinson of Windrush, 2 Fairleas, Sittingbourne, Kent, as from 1st July of this year, and new enquiries should be addressed to him, though Mr Byers will finish outstanding matters which he already has in hand.

We wish Mr Byers happy years of retirement, and we thank Dr Watkinson for his willingness take over from him. We look forward to years of happy co-operation.—S.N.A.J.



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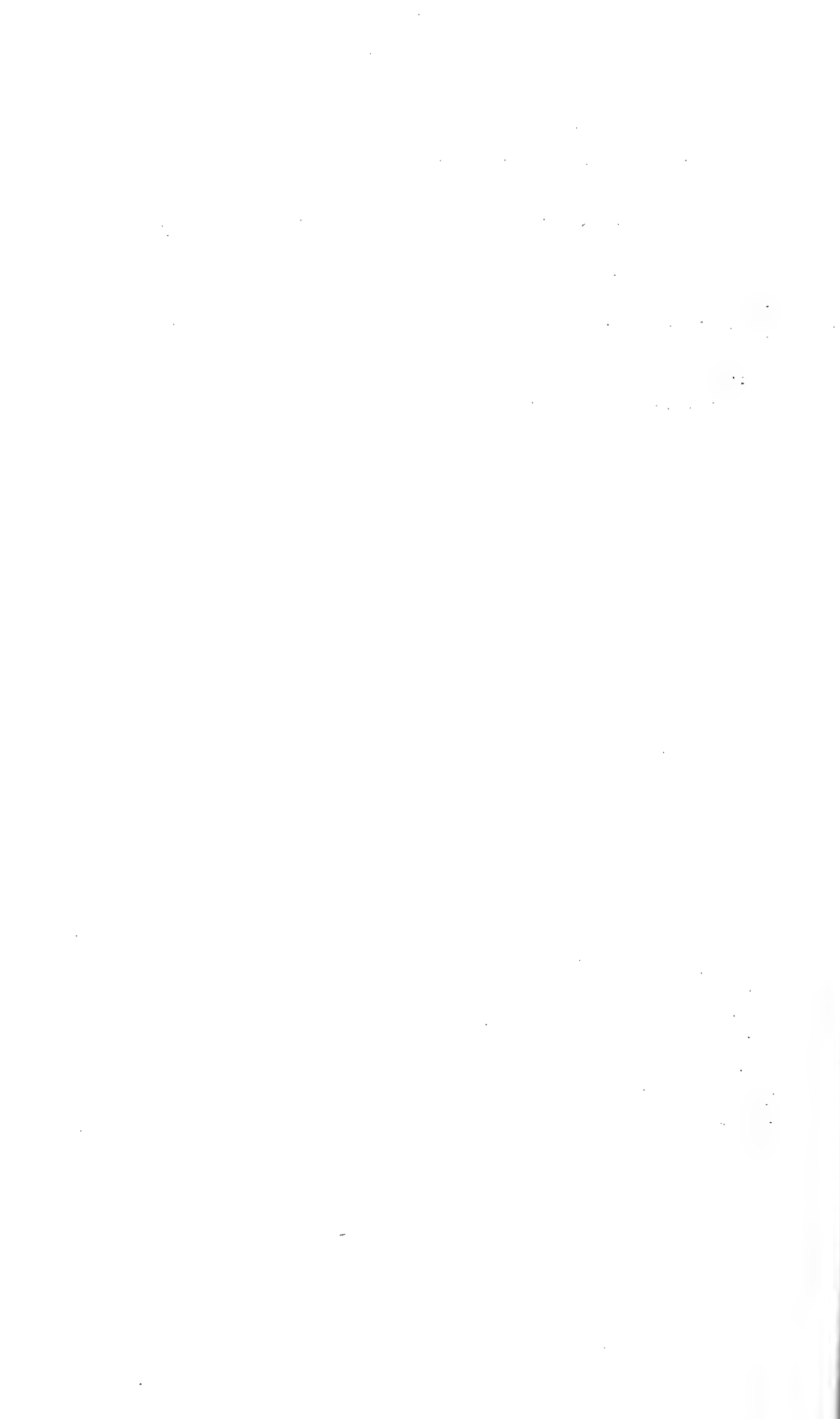
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All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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Contributors are requested not to send us Notes or Articles which they are sending to other magazines.

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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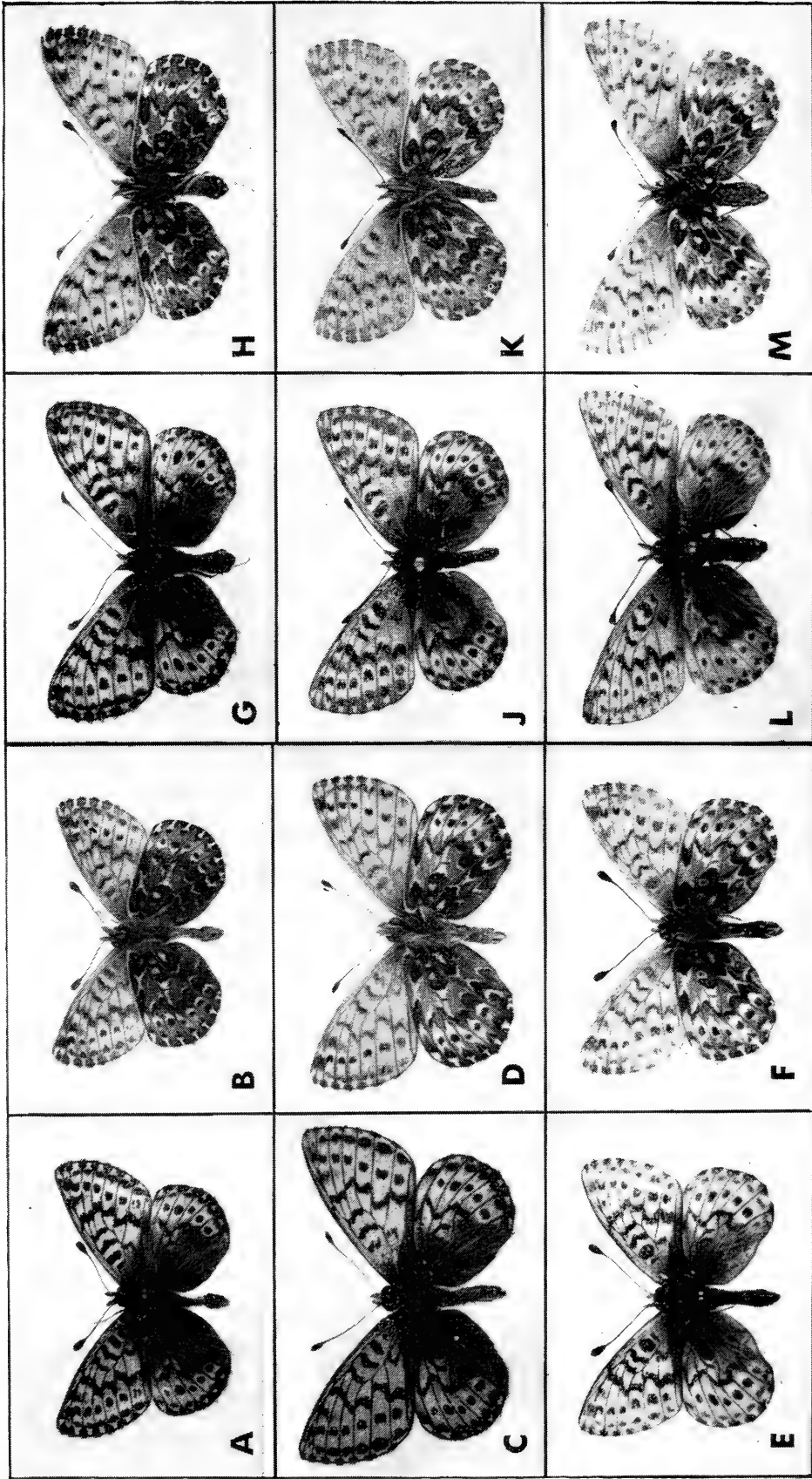
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A New Sub-species of *Boloria polaris* from Canada (Lepidoptera: Nymphalidae)

JOHN H. MASTERS

P.O. Box 7511, St Paul, Minnesota, U.S.A.

Boloria polaris (Boisduval) is usually quite rare in collections, but is a widespread circumpolar species of the high arctic. It does not occur south of 68°N in Europe (Higgins & Riley, 1970), but in North America occurs as far south as 56°N (The Belcher Island Group in Hudson Bay). Most collections containing the species have a fairly large series from one locality, but seldom have representation from numerous localities. This has probably obscured the geographic variation that occurs in the species and, surprisingly, for a species with such a wide range only three names have been proposed. In addition to the nominate subspecies from North Cape Norway, these include ssp. *gronlandica* (Skinner) from the west coast of Greenland and ssp. *americana* (Strand) from Jones Sound, Ellesmere Island.

I recently had the opportunity to examine intensively the drawers of *Boloria polaris* in the American Museum of Natural History in New York City. Although this collection lacks Asiatic material, it is undoubtedly the most complete collection of this insect in the United States. Geographic variation appears to be discrete and three primary populations are discernable, one of them unnamed. The unnamed population seems to have its centre of distribution on the west coast of Hudson Bay in Canada and is described below:

Boloria Polaris Stellata Masters, new subspecies

Male (Fig. A and B). —The same general appearance associated with all population of *Boloria polaris* but somewhat smaller and with a darker-redder ground colour and with a distinctly different appearance to the ventral hindwing. The expanse of one forewing (base to apex) is 15 to 17 mm (average 16 mm).

LEGEND OF FIGURES

Plate IX. males: A. *Boloria polaris stellata* new subspecies, holotype male, Churchill, Manitoba, 30 July 1933, A. V. Harper; B. underside of A; C. *B. polaris polaris* (Boisduval), male, Eagle Summit, mile 109 Steese Highway, Alaska, 20 June 1955, P. Ehrlich; D. underside of C; E. *B. polaris polaris*, male, Maalselvin, Lapland, Norway, 23 June 1937, P. Haig Thomas; F. underside of E. Females: G. *Boloria polaris stellata* new subspecies, allotype female, Churchill, Manitoba, 4 July 1947, T. N. Freeman; H. underside of G; J. *B. polaris polaris* (Boisduval), female, Toklat River, Mt. McKinley National Park, Alaska, 1 July 1955, P. Ehrlich; K. underside of J; L. *B. polaris polaris*, female, Finland (no other data); M. underside of L. All figures are natural size. Specimens figured are in the American Museum of Natural History, New York City.

Upperside (Fig. A): A marginal row of spots, at the vein terminuses, are greatly enlarged, quite rounded and touch the submarginal row of both wings. Heavy dark scaling on hindwing from anal margin thru basal area almost completely occludes cell. Long androconial "hairs" cover this basal area.

Underside (Fig. B): A somewhat orange ground colour to the forewing and a deep chestnut brown on the hindwings. White markings on hindwing with sharply distinct shape and with no apparent median or submedian band composed of whitish scales. Rows of submarginal and postmedian spots on forewing of approximately equal size.

Female (Fig. G and H).—The same appearance as the male, except having a more ashen (less reddish) ground colour and a slightly larger size. The expanse of one forewing (base to apex) is 16 to 22 mm (average 19).

Upperside (Fig. G): Appearance of male but lacking, of course, the androconial scales.

Underside (Fig. H): Appearance of male. White markings in basal area of hindwing are not as discrete as in the male; these combine with a band of lighter scales to provide a faintly discernable white band in the median area.

Holotype male.—Churchill, Manitoba, 30 July 1933, A. V. Harper, collector. Expanse of forewing 16 mm. In collection of the American Museum of Natural History, New York City.

Allotype female.—Churchill, Manitoba, 4 July 1947, T. N. Freeman, collector. Expanse of forewing 19.5 mm. In collection of the American Museum of Natural History, New York City.

Paratopotypes. — 38 males and 28 females, American Museum of Natural History, N.Y.C.; 4 males and 4 females Manitoba Museum of Man and Nature, Winnipeg, Manitoba; 4 males and 2 females, author's collection, Hudson, Wisconsin and 7 males, 6 females, collection of Patrick J. Conway, Chicago, Illinois.

Other localities — Paratypes were restricted to specimens from the type locality. Other populations that I consider belonging to this subspecies include specimens from the following localities: District of Franklin, N.W.T., Canada: Belcher Islands (Hudson Bay), Flaherty Island (Hudson Bay), Southampton Island; District of Keewatin, N.W.T., Canada; Eskimo Point, Chesterfield Inlet, Baker Island; District of Mackenzie, N.W.T., Canada: Coppermine.

Brief descriptions of the three subspecies of *Boloria polaris* follow:

Boloria polaris polaris. Arctic Europe north of 68°N, presumably all of arctic Asia and extreme northwest North America including Alaska, Yukon, portions of the District of Mackenzie and British Columbia south to Atlin and Summit Lake. These are large lightly coloured populations. Expanse of male forewings (apex to base) 19 to 24 mm for Alaskan males and 18 to 22 mm for Norwegian males; 20 to 24 mm for Alaskan females and 20 to 23 mm for Norwegian females.

Males and females with marginal row of spots (dorsal surfaces) smaller and only rarely (Alaskan females) touching the submarginal row on the forewings. Ventral hindwings with a very distinct whitish submedian band. Basal ground colour of ventral hindwings not a deep chestnut brown, as in ssp. *stellata*. There are a number of minor distinctions between European and American examples of this subspecies. It would be, however, impossible to describe the Alaskan population as a distinct subspecies without examination of Asian populations.

Boloria polaris stellata. Arctic North America west of Hudson Bay (including many islands in the Bay) and west to Coppermine (District of Mackenzie) on the fringe of the Arctic Ocean. The males of *stellata* are distinguishable from any other population by the chestnut brown background colour on the ventral hindwings and the lack of a discernable median or submedian white band.

Boloria polaris gronlandica (= *B. polaris americana*). Greenland, Ellesmere Island, Baffin Island and, probably, the northern portions of Labrador and Quebec. A small dark subspecies, males having forewing length of 15 to 18 mm and females 17 to 22 mm. Upperside much like *stellata* but slightly darker and with ground colour having a more yellowish cast. Undersides are more like *stellata* than nominate *polaris* but a submedian white band is usually discernable in both sexes and the basal ground colour of the hindwings does not have the rich chestnut red hue of *stellata*.

Boloria polaris stellata is biennial in the type locality and has recorded here only in odd-numbered years (e.g. 1933, 37, 39, 41, 43, 47, 51, 61, 63 and 67). Quite likely the species will turn out to be biennial in other localities as well.

Acknowledgements

I am very grateful to Dr F. H. Rindge of the American Museum, Mr Harry K. Clench of Carnegie Museum, Pittsburg, Pennsylvania and Dr Robert W. Nero of the Manitoba Museum of Man and Nature, Winnipeg, for allowing me to examine the collection in their care.

REFERENCES

- Higgins, L. G. and N. D. Riley, 1970. A field guide to the butterflies of Britain and Europe. Collins, London. 380 pp.

CORRECTION: It is regretted that the pagination of the May issue (85-112) has been repeated from the April issue. The May pages should be altered to 117-144, and these pages will be indexed by these revised numbers.—Ed.

Doubtful Derbyshire Lepidoptera

By DEREK C. HULME

Perhaps an apology is in order! It may seem unusual to publish an article on the *doubtful* records of a county but the writer feels it is time to put the record straight as regards many lepidoptera that have been long accepted—some for over a century—as genuine Derbyshire insects when the evidence is inconclusive or far from satisfactory.

This article mentions the 58 doubtful Derbyshire species that have appeared in print; not the rejected unpublished records submitted for the new Derbyshire list. It should be read in conjunction with the author's paper in *Entomologist's Gazette*, **19**: 65-72 entitled "The History and Bibliography of Lepidopterous Entomology in Derbyshire." Briefly, the important dates, relevant to this article, are 1863 when Edwin Brown's list "The Fauna and Flora of the District surrounding Tutbury and Burton-on-Trent" appeared; 1866, the year of the Rev. F. M. Spilsbury's "The Wild Flowers of Repton, with a list of I The Birds; II The Moths and Butterflies"; part one of "The Lepidoptera of Burton-on-Trent and Neighbourhood" was published in 1885, part two following in 1892; 1895 was the date of the first macrolepidoptera list for the whole county of Derbyshire and also saw the publication of Edward Meyrick's "A Handbook of British Lepidoptera"; The Victorian County History of Derby was published in 1905; and H. C. Hayward compiled full lepidoptera lists in 1919 and 1926.

D.A.J. is the abbreviation of the *Journal* of the Derbyshire Archaeological and Natural History Society; D.E.S., the abbreviation for the Derbyshire Entomological Society and *The Gnat* is their privately printed bulletin. The nomenclature adopted is that of I. R. P. Heslop's *Revised Indexed Check-List of the British Lepidoptera* (1959/61).

Papilio machaon L., Swallowtail. Though probably indigenous in earlier times, this species has now no claim to be regarded as a Derbyshire insect. Stephen Glover, in the 1829 edition of *The History and Gazetteer of Derby*, stated that it appeared from May to September but gave no further details. The Rev. F. C. R. Jourdain thought that it possibly occurred in the marshes of the River Trent and Sinfin Moor in the early 19th century. Hundreds were turned out, chiefly in the Matlock district, by John Wolley in the spring of 1843 and 1844 and these most probably account for the capture of two specimens near Matlock by T. Lighton recorded in *Zoologist*, **1**: 944.

Limenitis camilla L., White Admiral. A specimen in the D.E.S. collection at Derby Museum is labelled "Repton Shrubs, August 1910". In the D.A.J. 1913, H. C. Hayward wrote that one "was taken by a lad in the village—enquiries have not succeeded in tracing its origin from turned out larvae, pupae or bred specimens" and in his 1926 list he stated "this can scarcely be regarded as a survival, though honeysuckle is so abundant in the wood, but must presumably have been in some way accidentally

introduced". Arthur Henry Turner, compiler of *Lepidoptera of Somerset* (1955) was born at Repton and resident there until 1919. He submitted a list of lepidoptera recorded prior to 1919 and on subsequent visits. A record of *camilla* was included and he turned out to be the lad Hayward referred to. In reply to my query on this record, he thought that though it was "possibly, an escape, or a train passenger", he was pleased the specimen was still preserved.

Strymonidia purni L., Black Hairstreak. Insufficient evidence for admission to the county list even though accepted as the northern limit of this species by Edward Meyrick in 1895. One found by J. R. Hind in a box of specimens collected locally at Chesterfield prior to 1869 was recorded in *Intelligencer*, 9: 27, and quoted by Edward Newman. Alfred W. Richards, of Tibshelf (later Farnborough, Hants.), found a specimen "thought to be of this species" on the edge of a wood at Ault Hucknall in 1922.

Thymelicus sylvestris Poda, Common Small Skipper. Could well occur and is occasionally included in recent lists submitted for the new Derbyshire list but never confirmed with a specimen. Edwin Brown listed it as fairly common at Burton (Staffs.) prior to 1863. F. W. G. Payne included this record in his *A Catalogue of Macro-Lepidoptera of Derbyshire* (1895) altered to a misleading "not uncommon in the south [of the county]".

Coscinia cribaria L., Black-speckled Footman. Edward Meyrick (1895) gives the distribution as "Hants., Dorset, Derby (?)", very local". No further information traced.

Spilosoma urticae Esp., Water Ermine. Edwin Brown found larvae once near Burton, prior to 1863. Jourdain added a query mark in the Addenda of his 1905 V.C.H. list, though whether this was for its probable occurrence on the Staffordshire side of the border or that he doubted the record was not made clear. Hayward repeated this record in the form "Larvae once, near Burton?" in his 1926 list. The locality of Burton is still given in the 1961 edition of *South*, Series II, page 55.

Panaxia dominula L., Scarlet Tiger. There are four specimens in the Tring Museum labelled "Mill Dale, North Staffs, 1914, Vauncy Harper Crewe" (see *Proc. S. Lond. ent. nat. Hist. Soc.*, 1942-43, Part I: 11). Milldale is here described as "a narrow path between limestone cliffs on the north-east border of Staffordshire between Alstonefield and the River Dove". "Mill Dale" should read "Milldale", "Alstonefield" should be "Alstonfield" and the collector was Sir Vauncey Harpur Crewe of Calke. As Milldale is shared by the two counties, a fairer description of the dale would be "a narrow limestone gorge with a riverside path on the boundary between Staffs. and Derbys." Sir Vauncey was a rather eccentric character who employed collectors to obtain specimens in various places. The writer has been told tales of employees releasing bred and transported rarities on his estate of Calke Abbey for netting in the company of "the old man" (he was 68 years old in 1914 and 78 when he died).

Epichnopteryx pulla Esp., Transparent Sweep. H. C. Hayward recorded two ♂♂ and several ♀♀ bred from cases found in Repton Shrubs in 1916, adding "not at all a probable locality for this species". The record was mentioned in *D.A.J.* but not included in his 1926 list, so one must presume he had second thoughts on his identification.

Zygaena trifolii Esp., Broad-bordered Five-Spot Burnet. Frequently recorded throughout the county from 1943 onwards. The writer himself published a record in *D.A.J.* of 20 specimens at Stenson in 1949 but examples taken at this locality in subsequent years proved to be *Z. lonicerae* Scheven and expert confirmation is necessary for the other localities.

Agrostis clavis Hufn., Heart and Club. Fred. Payne remarked that he took this moth commonly at sugar at Chellaston in 1894. The *V.C.H.* repeats this single record. Hayward in 1926 queried the record with the comment "certainly not now common at this place and probably recorded in error".

Scopula immutata L., Lesser Cream Wave. John Hill, of Little Eaton, recorded this species in the 1895 list without details. Jourdain remarked that this was recorded in error and I presume John Hill himself gave this information in his contribution to the 1905 *V.C.H.* list.

Epirrhoe rivata Hübn., Wood Carpet. Ernest A. Price recorded a series of very beautiful gradations in markings from Coombs Dale prior to 1954 and noted the species as commoner in the Bakewell district in 1955. The writer examined his collection after the recorder's death in 1956 but found no examples of this species. It was recorded as common on a D.E.S. excursion to Langwith Wood on 6th July 1968 in *The Gnat*, **15**: 12.

Chesias rufata F., Broom-tip Chevron. Included in both the 1905 *V.C.H.* and Hayward's 1926 lists but the single record of one taken at a Burton light by Dr P. B. Mason, prior to 1885, refers to Staffs.

Carsia sororiata Hübn., Manchester Treble-bar. J. T. Harris stated that it occurred "sparingly" in Dovedale prior to 1885. The record was accepted by P. B. Mason, F. C. R. Jourdain and H. C. Hayward; the last-named compiler commenting that the species occurs at Charley Moss, fifteen miles to the S.W. in Staffs. H. W. Daltry, however, in *North Staffs. Field Club Transactions*, **85**: 56, states that "this is probably an error by an inexperienced collector, or due to mixing up insects from two localities. It is a species of wet bogs . . . and the food-plant Cranberry could not possibly occur in Dovedale". Harris was a reliable collector but the second possibility is feasible and this record therefore requires confirmation.

Eupithecia satyrata Hübn., Satyr Pug. A record of two taken at Matlock in 1936 by F. R. Larkin was published in *D.A.J.* N. Blackwell Wood showed me F. R. Larkin's annotated copy of the 1926 list and the locality was entered in the latter's handwriting. I found specimens in Mr Larkin's collection, presented to the D.E.S. after his death in 1945, but none bear a

label with a Derbyshire locality.

Pseudoboarmia punctinalis Scop., Pale Oak Beauty. The writer recorded one attracted to electric light, at Littleover on 3rd August 1954. The specimen was carefully checked before release and the record published in the *D.A.J.* Had I been aware that the species was new to the county list at the time, the specimen would have been taken for confirmation.

Cochylis roseana Haw., Rosy Conch. This species was admitted erroneously to all Derbyshire lists. Only one Staffs. record is involved and yet this has been altered in divers ways. It is worth giving the complete history of this one record to show how a simple observation can become distorted with the passage of time, rather like in the children's whispering game of "Passing a Message". In the 1863 list Edwin Brown gives simply "The Oaks". F. M. Spilsbury in 1866 extends Brown's record to "At The Oaks near Burton". J. T. Harris and P. B. Mason in their 1892 list alter the record to "Burton (E.B.), Repton Shrubs and Findern (F.M.S.)". Jourdain in the 1905 V.C.H. list gives "Near Burton; Repton Shrubs, Findern (?)"—not giving observer's names and rightly querying the Findern locality. Hayward's 1919 list gives "At The Oaks near Burton (W.G.)" i.e., the original record correctly quoted with the observer given as Dr William Garneys, compiler of the 1881 list (a revision of Spilsbury's 1866 list). In Hayward's 1926 list the record finally appears as "Repton Shrubs (W.G.)"—locality and recorder both incorrect!

The following microlepidoptera fall into mainly two categories. For completeness and to avoid tedious reading these are listed with all the known details under headings.

Burton district, prior to 1863 (Edwin Brown):

Acleris rufana Schiff., common; *A. literana* L., rare; *Laspheyresia gallicana* Guen.; *Epinotia nanana* Treits.; *Endothenia marginana* Haw., rare; *E. ustulana* Haw., rare; *Mniophaga senectella* Zell.; *Bryotropha domestica* Haw.; *Pexicopia malvella* Hübn.; *Scrobipalpa atriplicella* F. R.; *Caryocolum maculeum* Haw.; *C. fraternellum* Dougl.; *Dichomeris marginellus* F.; *Mompha decorella* Steph.; *Glyphipteryx equitella* Scop.; *Elachista humilis* Zell., queried without comment in the V.C.H. list; *E. zonariella* Tengst.; *Coleophora argentula* Steph.; *C. leucapennis* Haw., record queried by Mason and Harris in 1892; *Callisto torquilella* Zell.; *Epermenia illigerella* Hübn.; *Bucculatrix thoracella* Thunb.; *B. ulmella* Zell.; *Nemophora metaxella* Hübn.; *Stigmella hybnerella* Hübn., Repton and Repton Shrubs also given in 1905 V.C.H. and 1926 list respectively—no records traced for these localities; *Dechtiria intimella* Zell.

Burton, prior to 1892 (John Sang):

Lithocolletis coryli Nic.; *Stigmella malella* Staint.; *S. rosella* Schrank; *S. oxyacanthella* Staint.; *Nepticula pygmaeella* Haw.; *N. trimacullella* Haw.; *N. marginico-*

lella Staint.; *N. microtheriella* Staint.; *Dechtiria subbimaculella* Haw.

Burton district, prior to 1863 (Edwin Brown) and Burton, prior to 1892 (J. T. Harris):

Oecophora geoffrella L.

Burton district, prior to 1863 (Edwin Brown) and Burton, prior to 1892 (John Sang):

Coleophora badiipennella Dup.

Burton, prior to 1892 (P. B. Mason):

Tinea flavescentella Haw.

Burton, prior to 1892 (J. T. Harris):

Nemapogon granella L.

All the above microlepidoptera records have been published in Derbyshire lists and, though an indeterminable number *may* refer to the Derbyshire side of the county boundary near Burton upon Trent, most probably refer to Staffordshire.

Two further species are also doubtful. *Apotomis sororculana* Zett., Little Eaton, common prior to 1905 (John Hill and G. Pullen)—Hayward, in his personal Record Book, considered that this species was recorded in error. *Coleophora olivaceella* Staint., Derbyshire, prior to 1895 (Edward Meyrick)—original citation not yet found.

Kyle & Glen, Muir of Ord, Ross-shire.

Collecting Lepidoptera in Britain during 1971

By C. G. M. de WORMS, M.A., Ph.D., F.R.E.S.

After the first white Christmas for a great many years the new year opened with a very bleak spell which soon gave way to a very mild period with the thermometer at nearly 60°F on 10th January, a possible record for the first half of this month, the whole of which was well above the average in temperature. The early geometers started to appear well before the month was out, in particular *Phigalia pedaria* F. and *Erannis leucophaearia* Schiff. February followed suit with equally congenial weather with no really wintry periods, with the result that the spring noctuids began to emerge soon after the middle of the month *Orthosia gothica* L. and *Achlya flavicornis* L. Even *Dasycampa rubiginea* Schiff appeared from hibernation at this very early date for this insect. The coldest snaps ushered in March, but by the 9th spring conditions were supervening with some quite warm days. The middle of the month which saw a big emergence of insects, especially among the *Orthosias*, but two days in the Blandford area of Dorset starting on the 19th brought a blank owing to very chilly weather. However, back in Surrey there was quite a spate at light on the edge of Chobham Common on the night of 24th March. *A. flavicornis* was in great plenty with several *Apocheima hispidaria* Schiff and *Biston strataria*

Hufn. as well as *Orthosia munda* Schiff. and *Eupsilia transversa* Hufn. But two most welcome visitors were females of *D. rubiginea*, both of which eventually laid freely and the larvae were bred up.

The willows were in full bloom two days later, when I motored to Kent on the 26th. A really warm day greeted me on the 28th when I went over to Mr Michael Tweedie, near Rye. En route I called in at the Hamstreet woods where *Archiearis parthenias* L. was in numbers round the tops of the birches. *Gonepteryx rhamni* L. was well on the wing the last day of March together with *Aglais urticae* L.

The first few days of April were distinctly unseasonable but conditions improved considerably by the 6th when Mr J. Messenger and I set out northwards to spend the Easter period in the Lake District. We made our headquarters at the very spacious and comfortable Heaves Hotel which had been a previous haven for us, situated as it is only a few miles from Witherslack to the west, and Kendal to the north. There was virtually nothing on the wing by day when we toured Langdale and the Conistone area on 7th April. But night operations in the woods just north of Witherslack proved very rewarding with quite a spate of insects at our portable m.v. lights. Dusky forms of *Ectropis biundularia* Borkh. were quite numerous as also was *Eupithecia abbreviata* Stephens in a melanic form. We saw a single example of *Gypsotea leucographa* Schiff. *Achlya flavicornis* L., *Orthosia miniosa* Schiff., *O. munda* Schiff., *O. incerta*, *Xylocampa areola* Esp. and deep grey *Trichopteryx carpinata* Hübn. were the chief visitors, among eleven species of macros noted. *Orthosia gothica* L. and *O. stabilis* Linn. were the only patrons of the willow bloom.

The next day the 8th, we visited General Sir George Johnson at Brampton and then continued westwards to Orton Moss where in 1953 larvae of *Euphydryas aurinia* Rott. had been abundant, but we gathered it was in a very flooded condition and this insect has probably disappeared from that locality. We returned via Inglewood Forest and the Shap Wells Hotel, but saw no sign of insect life. We dined with Dr Neville Birkett and his family at his home on the high ground above Kendal. He had quite a number of visitors to his static trap, mainly the common spring noctuids. Good Friday, 9th April, broke much finer and the increasing sunshine tempted forth *Aglais urticae* L. in the Cartmel area. We also saw it later that day near Wharton Marsh, Arnside, but nothing favoured the willow at Witherslack that evening.

After a trip through the main lake region on the 10th to visit Mr N. G. Wykes near Cockermouth we once more resorted to the Witherslack woods after dark. They were again fairly productive of the species seen on our first night there. However, Easter Sunday, the 11th, turned out a really glorious day, when we negotiated the famous Kirkstone Pass, en route to Ullswater and on to the rather isolated Haweswater. *A. urticae* was again even more in evidence. That night the

Witherslack woods were alive with lepidoptera and we saw no less than 20 species at light. Besides most of those previously enumerated, we noted a further *G. leucographa*, a large number of *Orthosia munda* Schiff., also *Anticlea derivata* Schiff., *Selenia bilunaria* Esp., further dark *T. carpinata*, *Colostygia multistrigaria* Haworth and *Earophila badiata* Schiff. We found several *Trichopteryx polycommata* Schiff., just emerged on ash saplings and also had a couple of this species at light. The 12th of April, part of which we spent on Holker Moss was very much a blank day. However, the 13th improved with another very warm occasion with the thermometer topping 60°F when we motored via Thirlmere and Derwentwater to Rosthwaite, thence over the Honister Pass to Ennerdale Water and back over Ulpha Fell, but we saw nothing of note on the wing. That night we were once more in the Witherslack woods where, we had a further concourse to light including a good many *Biston strataria* Hufn., *E. biundularia* and *S. bilunaria*. Two more *G. leucographa* came to our sheet together with *A. derivata* and *Lycia hirtaria* Clerck.

Our final day on 14th April was spent on Holker Moss again, this time in warmth and sunshine which enticed out quite a number of *Archiearis parthenias* L., which as usual were very difficult to net as they dashed around the birch tops. Several *Inachis io* Linn. were also flying. We were again in our wooded locality after dark when we found several more *T. polycommata* on the small ash as well as a few of the little females. We ran out static m.v. trap in the grounds of Heaves Hotel during nine nights to very good advantage on the whole, recording just on 550 moths, though only covering thirteen species. The commonest of these was *Orthosia munda* in a great variety of forms. *Cerastis rubricosa* Schiff. was also well to the fore with many *O. stabilis*, *O. gothica*, *O. incerta* and *O. cruda* Schiff. There were several very dark examples of *Xylocampa areola* Esp. On our last night, 14th April, we had the first *Drymonia ruficornis* Hufn., a very early date for this species in this northerly parts.

On 15th April we set out in dull weather via Skipton and Ilkley to Leeds where Mr Messenger took the train south, while I went on to Sheffield to stay with Mr W. Reid whose trap that night was a mass of moths, quite 500 individuals, chiefly the common spring noctuids. *Panolis flammea* Schiff. was already out among the host of visitors. On the 16th I proceeded to Nottingham for a weekend meeting of the Ornithologists' Union. En route I halted near Ollerton, but it had turned too cold for anything to be flying round the birches, and nothing appeared of note during the next two days. I finally returned to Woking, on 19th April, after a very pleasant sojourn in the northern counties.

Some very welcome warm weather greeted me on my return south with the temperature rising to the 70s. I had quite a concourse in my sister's garden at Virginia Water on 20th April when I was surprised to have two *Odontosia carmelita* Esp. at

light, just freshly out. Other visitors included several *Polyplocia ridens* F. and *Drymonia ruficornis* as well as *Xylocampa areola* and *Eupithecia abbreviata* Stephens.

The fine spell continued for the next few days. On 21st April *Saturnia pavonia* Linn. was flying freely on Horsell Common. But the last week of the month was much cooler. However, on the 29th again at Virginia Water *P. ridens* and *D. ruficornis* were once more in evidence at light with *Rheumaptera cervinalis* Scop. which was unusually numerous just at this period. The warm weather returned with the start of May.

On the 2nd, a lovely spring day, I surveyed the area between Chiddingfold and Petworth. Many butterflies were on the wing including a spate of Brimstones and Orange-tips. Even the females of the latter species were flying at this early date for them. Another glorious day greeted me when I set out for the New Forest on 8th May. I had just had a female *S. pavonia* out from Surrey stock and she duly attracted a number of very fresh and fine males on Beaulieu Heath that afternoon. I went on to stay with Admiral Torlesse, but we saw nothing of note at light in Rhinefields owing to a near frost, while his trap at Sway only produced a few *Orthosias* and *Menophra abruptaria* Thunb. On 11th May the shade temperature touched 77°F. That night among 19 species at light on the edge of Chobham Common by far the commonest was *Colocasia coryli* Linn. The Prominents were represented by *Pterostoma palpina* Clerck, *Notodonta trepida* Esp. and *Drymonia ruficornis* Hufn. Geometers were well to the fore with *Bapta bimaculata*, *Cosymbia punctaria* L., *C. albipunctata* Hufn., *Selenia tetralunaria* Hufn. and *Eupithecia nanata* Hübn. The very warm spell went on well into the middle of the month, though it was much less hot on the 16th when Mr Messenger and I were in the Chiddingfold region again. *Clossiana euphrosyne* L. was fairly numerous with further *Anthocharis cardamines* L. The next day, 17th May, I set out for Greece, only returning to England on 7th June.

But unlike the similar period in 1970 the start of June was far from propitious with very wet and comparatively cold spells. However I joined Mr Russell Bretherton and other members of the British Entomological Society in an evening's collecting on the downs between Ranmore and Gomshall. In spite of quite cool conditions several interesting species came to light including *Deilephila procellus* L., *Dasychira pudibunda* L., *Eupithecia subumbrata* Schiff., *Horisme vitalbata* Schiff. and *Xanthorhoë designata* Hufn., while a number of *Scopula ornata* Scop. were found at rest together with *Diacrisia sannio* L. including females, flying at dusk. 13th June was a reasonably fine day when I surveyed part of Chobham Common where I found *Perconia strigillaria* Hübn. flying in numbers with several females, though the males were predominant. That afternoon I was pleased to see *Clossiana selene* L. in great plenty in the Chiddingfold district with a good many *Polyommatus icarus* Rott.

On the 19th I travelled to Kent and tried the well-known Hamstreet woods that night to fair advantage under quite congenial conditions. Among 30 species seen up to midnight were *Pterostoma palpina* Clerck, *Drymonia dodonaea* Schiff., *Thyatira batis* L., *Notodonta ziczac* L., *Dasychira pudibunda* L., *Deilephila elpenor* L., also the geometers *Sterrrha subsericeata* Haworth, *Iodis lactearia* L., *Bapta temerata* Schiff., *Plagodis dolabraria* L., *Ectropis extersaria* Hübn., *Pseudoboarmia punctinalis* Scop. and *Biston betularia* L. Both the White and Buff Ermines (*Spilosoma lubricipeda* L. and *S. lutea* L.) were late-comers. The next two days, though warm and sunny, provided little of note either near Wye or Folkstone by day. However, I had another even better night session in the Orlestone Woods at Hamstreet on 21st June, when, though comparatively few species came to light, their quality was high. For among only 15 species the only two examples of *Tethea fluctuosa* Hübn. which came to the sheet were melanic, one of them an extreme form which is a great rarity in this insect (vide *Ent. Rec.*, 83: 324). I was also amazed when the only Ermine which came was the dead white Water (*Spilosoma urticae* Esp.), seldom seen in this wooded region. The other few species were virtually the same as I had seen on the earlier occasion, except for *Electrophaës corylata* Thunb. I returned to Surrey the next day, the 22nd, when a much warmer spell started. I was again in the Chiddingfold area on 27th June when *C. selene* was still about in fair numbers together with a lot of the Large Skipper (*Augiades sylvanus* Esp.)

July opened with another warm day which heralded one of the hottest continuous spells during recent summers. *Plebeius argus* L. was already well out in the Chobham area on the 1st. The night of 2nd July was quite productive near Bisley with just over 40 species to light by 12.30 a.m. A huge female *Laothoë populi* L. was an early arrival. But *Notodonta ziczac* L. was the only Prominent. Both the Pebble and Scalloped Hooktips appeared (*Drepana falcataria* L. and *D. lacertinaria* L.). Among the few noctuids were *Polia nebulosa* Hufn., *Hadena contigua* Schiff., *Lithocodia fasciana* L. and *Plusia pulchrina* Haworth. It was geometers which were by far in the ascendancy. No less than four *Boarmia roboraria* Schiff., all melanic, were among 20 other species of this group. The next commonest was *Comibaena pustulata* Hufn. Other more interesting species included *Sterrrha inornata* Haworth, *S. trigeminata* Haworth, *S. subsericeata* Haworth, *Cidaria fulvata* Forst., *Mysticoptera sexalisata* Hübn., *Semiothisa liturata* Clerck, *Ellopia fasciana* L., *Plagodis dolabraria* L., *Cleora repandata* L. and *Bupalus piniaria* L. 4th July was a very warm and sultry day, with 77°F in the shade, when I went to visit Dr J. Holmes near Bordon. But a local marsh only produced one late *Euphydryas aurinia* Rott. which had been fairly numerous a few weeks earlier. *Eustrotia uncula* Clerck was on the wing by day with a few *Ortholitha plumbaria* F. Later that afternoon we found *Plebeius argus* L. flying in some numbers on a nearby

heath with a lot of *Polyommatus icarus* Rott., *Augiades sylvanus* L. and *Maniola jurtina* L.

The next few days were quite phenomenal with the thermometer well into the 80's on each occasion and it was extremely warm on 10th July when I revisited the Petworth and Chiddingfold area, but saw on the whole comparatively little on the wing, except for a few *Limenitis camilla* L. and *Aphantopus hyperanthus* L. However, the temperature was just touching 90°F when I set out for then New Forest on the 11th. I called in at Alice Holt Forest but no *Apatura iris* L. had been seen. The heat was intense when I surveyed Burley Enclosure in the Forest, where I was pleased to see a number of *Argynnis adippe* L. careering over the bracken, an insect which has been absent from many of its former haunts in that region.

I travelled on to Portland later that day putting up at the Pennsylvania Castle Hotel where I was given special facilities for setting up my static m.v. moth trap. It turned out to be a remarkable night. I ran my portable light for two hours overlooking Church Ope Cove. Among the first arrivals of 22 species was *Epirrhoë galiata* Schiff. and *Ortholitha bipunctaria* Schiff. with several *Sterrha degeneraria* Hübn soon following. Late-comers included *Deilephila porcellus* L., *Phragmatobia fuliginosa* L., *Callimorpha jacobaeae* L., *Agrotis trux* Hübn., *Apamea lithoxylea* Schiff. and *Cleora rhomboidaria* Schiff. But the following morning I found a host of insects in the trap run in the hotel garden with no less than 275 individuals representing 61 species of the macros. By far the most numerous was *Agrotis trux* of both sexes, each showing considerable variation. A very welcome visitor was *Leucoma salicis* L., by no means common in that region. There were also a few *Nudaria mundana* L. among the noctuids. Besides *A. trux* the next most plentiful insect was *Leucania l-album* L. Other species included *Caradrina ambigua* Schiff., *Parastichtis suspecta* Hübn., *Pyrrhia umbra* Hufn. and *Unca triplasia* L. The chief geometers were *Epirrhoë galiata* Schiff., *Eupithecia haworthiata* Doubl., *E. absinthiata* Clerck, *Abraxas grossulariata* L., *Crocallis elinguraria* L., but only single examples of *Sterrha degeneraria* Hübn. and *Zeuzera pyrina* L.

The morning of 12th July was again very sunny, but less oppressive than the previous day. Butterflies were very numerous among the rocky clearings, mainly at the top of the hill at Portland. *Lysandra coridon* Poda was just appearing with some very fresh males, while there was a good showing of *Plebius argus* L. I had a stroke of good fortune in taking a female *P. argus* with almost spotless underside, a great rarity in this species. *Eumenis semele* L., *Melanargia galathea* L. and *Argynnis aglaia* L. were also well in evidence. That afternoon I motored to Lyndhurst putting up in the Lyndhurst Park Hotel, formerly the Grand. That evening I joined Admiral Torlesse in Rhinefields where it turned out rather a cool night. However, we saw *Hyloicus pinastri* L., *Stauropus fagi* L., *Eilema deplana* Esp., *Plusia pulchrina* Haworth, *Deileptenia ribeata*

Clerck (*abietaria* Schiff.), also several *Cosymbia linearia* Hübn. and *Boarmia roboraria* Schiff. The hotel at Lyndhurst had given me facilities for running my static trap in the spacious garden. It attracted just a hundred insects comprising 36 species of macros which included a dozen *Deilephila elpenor* L. also *D. porcellus* L. and a couple of *H. pinastri* L. Other visitors comprised *Arctia caja* L., *Hippocrita jacobaeae* L., *Eilema lurideola* Zinck., *Polia nebulosa* Hufn., *Polychrisia moneta* F., *Plusia chrysitis* L., *Cidaria fulvata* Forster, *Perizoma alchemillata* L., *Biston betularia* L. and *Ouropteryx sambucaria*.

Another warm and sultry day broke on 13th July which saw me in woods south of Salisbury where *Limenitis camilla* L., *Argynnis paphia* L. and *Polygonia c-album* L. were on the wing. I returned to Surrey in the evening. A further extremely warm week followed. On the 15th many butterflies were flying at Witley with the Ringlet in great plenty. It was cooler on 18th July when I joined Mr and Mrs J. A. C. Greenwood in Alice Holt Forest. They were accompanied by Mr Sidney Pooles who had come specially from Eastbourne in the hope of seeing some Purple Emperors of which, fortunately, several appeared during the morning, including more than one female. That afternoon the Silver-studded Blue was abundant at Chobham. I set out the next day, 19th July, for Austria and Yugoslavia only returning on 7th August.

Rather dull weather greeted me back in Surrey, though a few late *P. argus* were still about at Chobham on 8th August and I flushed an occasional *Selidosema brunnearia* Vill. The subsequent week, though very mild, did not produce much by day or night. But the middle of the month saw a change for the better with the thermometer touching the 70's once more. Quite a number of Peacocks and Commas appeared on local buddleia. It was a glorious day on 17th August when I accompanied the Rev. Anthony Harbottle and his two young sons to the Chiddingfold area and on to the vicinity of Petworth. In these two localities we saw no less than 20 species of butterflies during that lovely day (vide *Ent. Rec.* **83**: 324). The Wood White (*Leptosia sinapis* L.) was quite numerous as also was the Brimstone (*Gonepteryx rhamni*). We caught site of a Purple Emperor flying high over the dense oak forest. There was also several *Argynnis paphia* L. and White Admirals still on the wing, together with *Thecla quercus* L. and *Celastrina argiolus* L. Peacocks and Commas were seen near Petworth. After a reading of 82°F in the shade on 19th August, the temperature dropped considerably on the 20th when I travelled to Blandford to visit my relations, but little of interest was on the move in that vicinity. On my way home on the 22nd I halted at some downland, near Salisbury, which used to be good ground for *L. coridon*. But it was dull and cloudy and I only flushed a single male of this insect. To my astonishment on examining it in the net I found it was a very fine *ab. fowleri* with pure white borders. I had not seen this scarce form for well over twenty years in

that area.

The next morning I set out for the Orkney Isles which I last visited in 1969. I had, as it turned out, a most adventurous journey. Our plane just made Dyce Airport at Aberdeen owing to fog which came down very thickly, so that further flights north were cancelled. After waiting a couple of hours, the authorities gave several of us free vouchers to continue our journey by train. We got to Inverness in the late afternoon and then continued by that most picturesque route up the east coast of Scotland, eventually reaching Thurso about 10 p.m. Fortunately the Royal hotel was able to put me up for the night before embarking next morning at Scrabster on the *St Ola* for a 2½ hour sea trip to Stromness, passing en route the huge cliffs of Hoy with their galaxy of sea birds, fulmars, razorbills, black guillemots etc.

I was met on the quay by Mr Ian Lorimer and his family whom I had been able to advise of my delay in reaching them. We were soon in their manse at Scorradale, near Orphir, which had proved such a delightful centre two years previously. Conditions were very mild and it turned out possibly a record night for numbers in Mr Lorimer's static trap and in the Heath trap he placed on the moors behind his house. We noted almost a thousand visitors in both traps comprising 40 species of the macros. Next to some 300 *Proctna pronuba* L. were over 200 *Amathes glareosa* Esp. with a large proportion of the melanic f. *edda* and many integrades between this form and the normal pale type, a most interesting local cline. Besides over 100 each of *Amathes xanthographa* Schiff. and *Apamea secalis* L. other noctuids included a single *Eurois occulta* L. of the pale form, a couple of *Rhyacia simulans* Hufn. of the small dark form, several *Apamea furva* Schiff. including a female, always rare in this species. *Aporophyla luneburgensis* Freyer was very fresh, all the jet black type, while *Amathes castanea* Esp. were mainly very dark. There were a few late *Diarsia festiva* Schiff. of the dark race, f. *orcadensis* and pale *Apamea crenata* Hufn. late *Lycophotia varia* Vill also dark *Stilbia anomala* Haworth. The *Plusias* were represented by a number of *P. gamma* L. and *P. chrysitis* L. and a single *P. festucae* L. Among ten species of the geometers were no less than twenty *Ortholitha chenopodiata* L., some very dark with several of the very well-marked local race of *Dysstroma citrata* L., also a few each of *Lygris testata* L., *L. populata* L., *Entephria caesiata* Schiff., *Xanthorhoë munitata* Hubn. and *Colostygia didymata* L. It was altogether a most memorable occasion with such remarkable numbers for these northerly regions.

A fine day greeted us on 25th August, when my host and I visited a small local loch and flushed a large number of *D. citrata*, all just out. Back at Orphir we saw fresh *Polyommatus icarus* Rott. and worn *Argynnis aglaia* L. The afternoon saw us on South Ronaldshay where the Burray sandhills provided some *Euxoa tritici* L. and *Cerapteryx graminis* L. from rag-wortheads. That night some 300 insects visited the two traps

They mainly comprised the species of the previous night, with the addition *Scotogramma trifolii* Hufn. in a very pale form, also *Celaena haworthii* Curtis and *Hydraecia lucens* Freyer. *A. glareosa* was again very numerous.

August 26th was a very blank day with continuous rain which prevented any collecting and even the traps were attended by a much sparser assemblage. However, conditions improved the next day when we surveyed several good localities on the mainland, but it was too windy for any captures by day and again smaller number at the m.v. lights. It was much milder on the 28th when we revisited the Chair of Lyde, seeing some late *A. aglaia* and *P. icarus* and finding several large *S. pavonia* larvae. That night we tried our m.v. portable apparatus and the Heath trap on Hobbister Moor to very good advantage. The chief feature was the abundance of *Amathes agathina* Dup. which came freely to our lights. There was also quite an attendance of geometers, especially *D. citrata* and *E. caesiata* with a few *L. testata* and *L. populata* still fresh. The only newcomer was *Oporinia filigrammaria* H.-S., while in the static trap we had the first *Dasipolia templi* Thunb.

It was dull again on 29th August, when Mr Lorimer and I penetrated to Eavie on the north coast of the Orkney mainland opposite the island of Rousay, where there was a large growth of butterbur but little was on the move, though a few late *Pieris napi* L. were seen. Some 250 moths were in the trap at Scorradaile, mainly the usual common noctuids with a good admixture of *A. glareosa*. My last active day, the 30th, was again rainy and overcast when we went into Kirkwall to view a male *Herse convolvuli* L. which a local tradesman had found at rest on his premises. That evening we were once more at Eavie in the hope of seeing *Gortyna petasitis* Doubleday, but none were forthcoming and it is very doubtful if this large noctuid occurs as far north as Orkney. So ended a very pleasant and successful week in these delightful surroundings. The last day of August I had a smooth flight from Kirkwall via Inverness and Glasgow back to Heathrow.

September opened with some glorious weather, with temperatures well into the 70's, but butterflies were not as plentiful as might have been expected. On the 4th, another very warm day, I travelled to Kent, making my headquarters at Folkestone, but little came to light or sugar that night at Dungeness, though *Aspitates ochrearia* Rossi was flying well. The thermometer stood at 76°F in the shade on 5th September when I went over to visit Mr Michael Tweedie near Rye. Many *Aglais urticae* L. were patronising his buddleias together with *Pieris rapae* L. and *P. napi* L. I returned to Surrey that evening and was greeted with a similar temperature the next day, the 6th, when many small Tortoiseshells were flying.

On 7th September I flew out to Jamaica where I stayed two weeks before going on to New York and then to Toronto, only getting back to England on 15th October to find a very

fine and mild autumn awaiting me. *A. urticae* L. was still on the wing and a good many Whites. Some remarkably mild weather with very high temperatures were the feature of the last half of this month. On 22nd October and again on the 24th it was just over 70°F, while during the rest of October it was over 60°F almost daily and this high level of warmth continued well into the first week of November. But conditions were much cooler when I visited Kent on the 12th. I tried light at a well-known locality near Wye, but it was too cold for anything of note to be attracted. The whole of November passed without any really cold spell. On the 21st several *Erannis aurantiaria* Hübn. came to light at Virginia Water. Even in December the level of temperature was well into the 50's for most of the month, almost reaching 60°F on the 21st. Even over the Christmas period many of the winter species of moths were to be seen, especially *Erannis defoliaria* Clerck in all its variety of forms.

So ended a year which, though blessed with some remarkably fine weather, was like its predecessor very disappointing as regards migrant insects, with very few of the regular species being recorded. Butterflies were reasonably plentiful, but apart for another good year for the Holly Blue, there was no really outstanding abundance of any particular species, and similar observations can be made of the moths as well.

Three Oaks, Woking.

Notes on the African Lunar Moth, *Argema kuhnei* Pinhey (Lepidoptera : Saturniidae)

JAMIESON C. LITTLE

On 10th September 1968 a yellow male lunar moth was taken at mercury vapour light in Mbala, Zambia. The moth was sent to Dr E. Pinhey, Curator of the National Museum, Bulawayo, who described it (1969) as a new species, *Argema kuhnei*, after its discoverer, K. W. Kühne, Director of the International Red Locust Control Organisation.

I took two more specimens (one of each sex) at mercury vapour light in Mbala in 1970 on 25th August and 3rd September respectively. Pinhey (1972) has subsequently described the female (Plate X).

In April 1971 I noticed an old cocoon fastened to a twig. It appeared to be similar to cocoons of *Argema mimosae* (Bsd) and of *Argema mittrei* (Guer). I considered the probability of its being a cocoon of *A. kuhnei* Pinhey. Later I found another empty cocoon lying on a path just over a mile from Mbala. Kühne sent these two cocoons to Pinhey who agreed that they were probably those of *A. kuhnei* (Plate XI).

The tree on which the first cocoon was found was indentified at the International Red Locust Control Herbarium as *Monotes katangensis* (de Wild). According to Delevoy (1929) this tree

is common in Katanga Province of Zaire, except in the north where it is replaced in the valleys by allied species. It is a tree of wooded savannah and is most frequent in regions of poor soil.

After an intensive search on *M. katangensis* around Mbala I found about thirty cocoons. Only twelve were heavy, indicating living pupae within. The help of villagers was enlisted in the Lunzua district approximately fourteen miles from Mbala. About sixty cocoons were found in this area but all were empty. Kühne also searched for cocoons in Mbala and found approximately thirty but only two were viable.

On 19th August 1971 the supposition concerning the nature of the cocoons was confirmed when two male *A. kuhnei* emerged, indicating *M. katangensis* as a definite foodplant.

In the Mbala district there were seldom more than two cocoons on one tree. Dr J. Scheven and N. S. Irving (in personal communication) stated they experienced heavy losses due to virus when rearing *A. mimosae*. It is possible that *A. kuhnei* is also very virus-prone in some of its early stages. Bush fires may also taken an annual toll of cocoons. From approximately one hundred and twenty cocoons gathered by Kühne, Lunzua villagers and myself, only fourteen yielded moths.

In an attempt to obtain a pairing two moths were kept alive in a muslin charaxes trap. Between 9th and 13th September one hundred and ten eggs were laid. No larvae emerged and all eggs collapsed (Plate XI). An unsuccessful search was made for larvae in September and October.

It appears from the number of cocoons found that *A. kuhnei* is well distributed in the Mbala and Lunzua areas. There are few lepidopterists in Zambia and it is possible that this moth (see Fig. 4) would be found in other parts of the country if a search were made.

Emergence from cocoons 1971: August 19th (2 ♂), 26th (1 ♂), 27th (1 ♂), 28th (1 ♀), 29th (1 ♀), 30th (1 ♂), September 1st (1 ♀), 2nd (1 ♀), 3rd (2 ♀ — K. W. Kühne), 4th (1 ♀), 6th (1 ♀), 8th (1 ♂). All these moths emerged during the afternoon period.

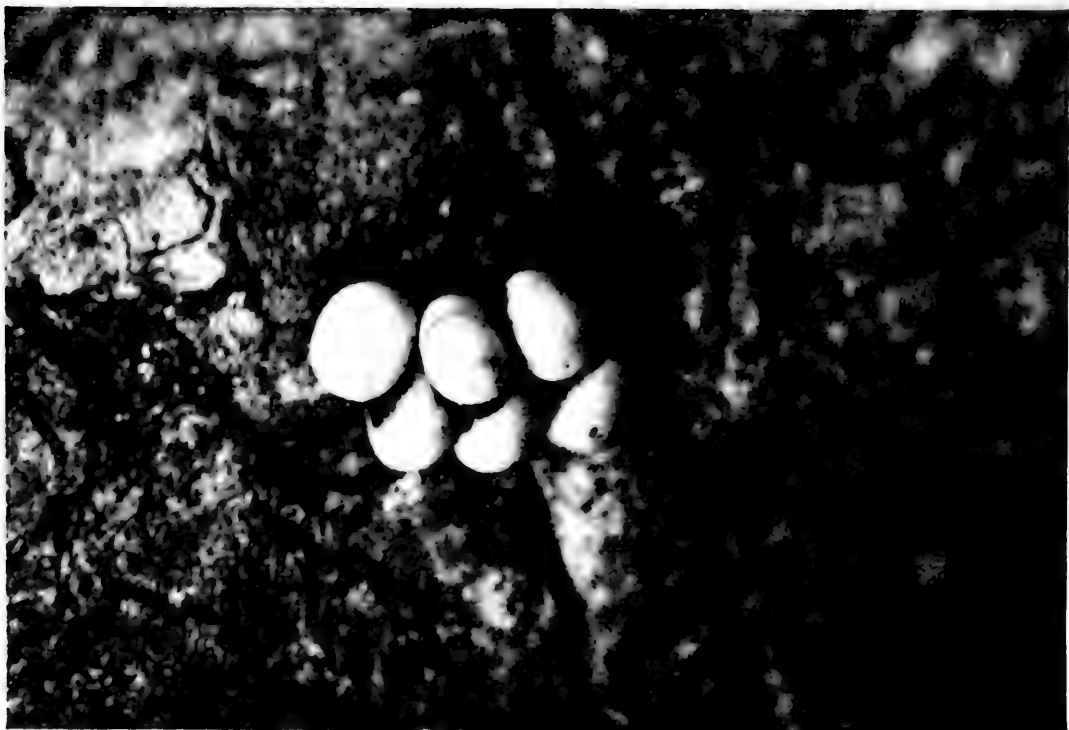
Acknowledgements

I am indebted to my wife, Renate, and to Mr Soft Simwila for their efforts in searching for cocoons. K. W. Kühne and Dr E. Pinhey kindly read the manuscript and made helpful suggestions. K. W. Kühne supplied the photographs.

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Euphydryas aurinia Rott. in the Isle of Wight

By H. C. HUGGINS, F.R.E.S.

I was greatly interested in Mr Fearnough's article on the butterflies of the Isle of Wight (57) and particularly in the account of *aurinia*.

Mr Fearnough quotes Frohawk's statement that the form at Cowes is almost similar to the Irish race.

In the winter of 1949 I wrote to my late friend Dr K. G. Blair, who was then living at Freshwater Bay to ask him whether he would like me to try to get him some Irish *aurinia* in 1950, as I proposed spending six weeks at Glengariff, and the butterfly seemed to be returning there after a long absence. Blair replied that he did not want any as *praeclara* Kane was found in the island, and sent me four which I still have. These are all labelled "Isle of Wight Cranmore" three 1948 and one 1949. Although slightly duller than the brightest *praeclara*, they are certainly of that form and indistinguishable from specimens I have from Sir Charles Langham, taken in Co. Fermanagh.

Aurinia is a strange insect; when I first knew Glengariff in 1914-1919 it was generally distributed in the district. The only surviving specimen I have, taken in the Coomerkane valley, is the brightest *praeclara* of my series.

When I returned to the locality in 1948 Philip Graves informed me that it was quite extinct there, but I saw a few in 1949 and in 1952 it had established several little colonies, but these were all *scotica* Robson. *Aurinia* then had also two or three colonies on the road to Mizen Head.

I think Frohawk is a bit vague in referring to the Irish race; I have taken *aurinia* in several Irish districts, and in most of these the local races differ and in some cases are like those from English colonies.

I am sorry to hear that the Island is becoming built up and fitted for motor traffic. I have not been there since the outbreak of the war in 1939, but about fifty years ago, the late L. T. Ford and myself collected a good deal for micros in the narrow overgrown lanes between Yarmouth and Freshwater. I suppose these have all been "improved."

Should *aurinia* still exist on the Island, it may turn up anywhere again. In my experience it has two phases which I call static and dynamic. I have known a small colony of half a dozen remain in a hollow perhaps thirty yards in diameter, and gradually become worse and worse in condition until its members died of old age. On the other hand I have seen it flying rapidly across the Caha plateau at Glengariff twelve hundred feet above sea level, and at least two miles from the nearest colony, and in 1949 I saw one on the road up Mount Mangerton, Killarney, 800 feet up. I wanted to see what it was like, and pursued it for about 200 yards without gaining an inch, when it

rose and flew over a belt of firs. I should perhaps mention that in those days I could run down *hyale* on the wing and had not yet become in the graphic words of Surtees: "a worn out old devil that could do nothing but eat."

Isle of Canna Notes for 1970 and 1971

By J. L. CAMPBELL

Additions to "Macrolepidoptera Cannae", see Record September 1970 et seq.

268. *P. viridaria* Clerck (Small Purple Barred). One in m.v. trap on 9/6/70. (157a in list).
269. *C. ligustri* Schiff. (The Coronet). A worn specimen in m.v. trap on 20/7/71.
270. *S. costaestrigalis* Steph. (Pinion-streaked Snout). A worn specimen in the trap on 2/8/71. Identified by Mr E. C. Pelham-Clinton.
271. *L. viretata* Hübn. (Yellow Barred Brindle). One in trap on 25/5/71.
272. *P. comitata* L. (Dark Spinach). One in trap on 13/7/71. (Previously taken on Canna by Dr Michael Harper in 1957 and by J. L. C. on Barra).
273. *C. jubata* Thunb. (Dotted Carpet). One in trap on 31/7/71
274. *B. piniaria* L. (Bordered White). One in trap on 3/6/71.

Other records of interest

1. *P. brassicae* L. A freshly emerged male was found below the wood east of my house on 23/4/71. I do not remember seeing *brassicae* here in April before.
5. *V. io*. Still absent from Canna, but I was glad to see a specimen on the east side of Loch Awe in Argyllshire near the south end of the loch on 14/10/70.
9. *A. selene* L. was seen again in the Haligary gulley in June 1970 and 1971. In 1971 it also appeared in clearings in the wood planted between the gulley and my house in 1956-57 for the first time.
11. *P. aegeria* L. Not seen in 1970, but appeared again in 1971 on 30/7/71 in the wood behind my garden (in the same patch of sunlight where specimens were seen in 1968 and 1969) and in my garden on 2/8/71. An obviously different specimen was seen in my garden on 12/8/71. The woods were all searched around this time, but no other specimens were seen.
25. *N. dromedarius* L. Specimens were taken in the trap on 25/5/71 and 28/7/71, the first since 1956.
43. *E. irrorellq* L. Many larvae noticed sunning themselves on the low south-facing cliffs at Sgorr nam Ban Naomh on 14/4/71, several taken home, two emerged June 1st.
58. *A. strigula* Thunb. (*porphyrea* Hübn.) 262 specimens out of a total of 402 moths on 28/7/71; 169 specimens out

of 345 moths in the trap on 3/8/71. Total for 1971, 545, the highest yet. Is this species a migrant? compare earlier sudden large trap catches in 1956, 1963, 1964 and 1965.

- 64. *N. augur* (Fab). Another specimen in the trap on 31/8/71.
- 90. *D. caesia* (Borkh.). Nine specimens of the Grey turned up in the trap in 1971, the first on 25th May, the last on 24th August.
- 94. *T. cespitis* Fabr. One specimen on 21/8/71.
- 116. *N. typica* L. One specimen in the trap on 30/7/71, the first since 1964.
- 123. *C. lutosa* Hübn. The Large Wainscot turned up again on 16/9/71 and 3/10/71.
- 164. *P. interrogationis*. L. A very good specimen taken in the trap on 1/8/71. Only once before, in 1966.
- 210. *P. flavofasciata* Thunb. 15 specimens were taken in the trap in 1971, of which 8 on May 25th.
- 241. *E. prosapiaria* L. This turned up again in 1970, one being taken in the trap on July 27th and another seen outside (sitting in my car!) on the 31st. The moth was not seen at all in 1971.
- 263. *Z. purpuralis* Brun. In 1970 the weather broke on June 21st and was very bad until July 23rd. The burnets must have had a terrible time; the same period had bad weather in 1969. In 1971 I visited the isolated western colony at Iolasgor (accessible only by sea) on July 17th. Not a burnet was to be seen. The rabbits had increased and the ground was eaten bare, except for patches of ragwort and nettles. One can only hope that this interesting colony of *purpuralis* will revive eventually.

Migrants In 1970 *V. atalanta* L. made a very early appearance on May 9th (one specimen seen in my garden and another on Sanday) and was seen a number of times between then and June 8th. In July I found a number of full-grown larvae on nettles amongst the trees in my garden; some of these were reared. *Atalanta* was around in the Autumn again, the last date being September 22nd. *Cardui* did not appear until the middle of June, four or five specimens being seen then and again in September. *Gamma* first appeared on June 10th and not again until August. Only a few specimens were noticed. *Noctuella* appeared in the trap on June 2nd and not again until September 16th, four on the 18th bringing the season's total up to seven.

General Notes. Except for two and a half weeks of brilliant weather prior to midsummer, the summer of 1970 was a very bad one. May is noted in my diary as the wettest, foggiest May I could remember. July was no better; there were a few fine days in August, but September was wet and stormy. I only found it worth while putting the trap on on 26 nights, the total caught being 1,813.

There was far more dry weather in 1971, but also a great

deal more wind. A consequence of the bad autumn of 1969 and bad summer of 1970 was that, apart from the whites, butterflies were scarce again. The trap was on on 55 nights catching a total of 4,309 moths, but the ten nights the trap was used in June produced only 236 of these, the June nights being cold and clear with northerly winds. Of the total of 4,309 moths, six common species produced 2,348 — *T. pronuba* 965, *A. strigula* 545, *A. secalis* 264, *X. monoglypha* 208, *T. stabilis* 197 (April was fine and warm) and *T. ianthina* 179. The most remarkable thing about 1971 was the fact that the trap produced six new species. I may add that Canna too has been colonized by the collared dove in the last two years.

In 1971 here was a total absence of migrants until July 10th, when the first *P. gamma* appeared. *Gamma* was thereafter much commoner than in 1970, a total of about 67 being seen or taken in the trap in which *E. hortulata* (Small Magpie) made its first appearance on July 13th. *Noctuella* did not return up until August 21st, *atalanta* not until September 26th and *cardui* not until October 4th. During several days of warm weather and strong southerly winds between October 24th and October 29th, single specimens of *atalanta*, and *cardui* were seen, usually around veronica at Tighard. This is unusually late, though in 1955 *atalanta* was seen in early November. *C. lutosa* Hübn. and *P. interrogationis* L. mentioned earlier are probably to be classed as migrants.

Heiskeir. Expeditions were made to Heiskeir on 6/6/70, when no lepidoptera were seen, though the number of wild flowers on this low and rocky isolated islet was impressive; on 28/7/70, when a pair of *P. icarus* Rott. was seen *in cop.*, as well as several specimens of *O. limitata*; and on 23/8/70, when a specimen of *V. atalanta* was seen, and a large number of *P. lutealis* Hübn. The Head lighthouse keeper this year produced specimens of *M. oleracea* L., *D. conspersa* Esp., *X. monoglypha* Hufn., *A. xanthographa* D. & Shiff., *P. gamma* L., and a large number of *C. graminis* L., also a specimen of *Ischnura elegans* of which he said there had been an invasion in June.

In 1971 an expedition was made there on August 17th, when the Head Lighthouse keeper produced specimens of *X. monoglypha*, *C. graminis*, *L. impura*, *P. gamma* and *O. limitata*.

WARWICKSHIRE ODONATA—I am engaged, in conjunction with Warwick Museum, in evaluating the status of all dragonflies found in Warwickshire. Their distribution in the county is being plotted on a 1 km. square grid. Owing to the size of this task, I am appealing to readers with Warwickshire records of all species to send them to me at my address below, giving the 4 or 6 figure grid reference, the date, and whether the record is for specimen or sighting, larva or imago.—G. S. VICK, 93 Manor House Lane, South Yardley, Birmingham 26. 9.v.1972.

The genus *Kinesis* Burr (Dermaptera : Chelisochidae)

By A. BRINDLE

The genus *Kinesis* is distinguished from all other genera of the Chelisochidae by the short elytra, each elytron having a well marked lateral longitudinal explanate margin or ridge; wings are absent. The genus was erected by Burr (1907:126) for one species, *Chelisoches punctulatus* Burr, 1897, which was described from a single female. Burr (1911:63), however, includes a description of the male forceps in his citation of the genus, and this appears to be due to a record of a male and a female of the same species in the Vienna Museum (Burr, 1912:92). The appearance of another name, *Kinesis mounseyi* Burr, in an account of the male genitalia of the Dermaptera (Burr, 1916:9), presents a puzzle, since, whilst no indication is given that this represents a new species, no previous description of this species can be found. It has not been traced in the Zoological Record.

Apart from the original description of *punctulata* and a very short description and figure of the male genitalia of *mounseyi*, nothing has been published on these species, so it was felt useful to re-examine the available material of the genus and to publish descriptions and figures of both species. The types of *punctulata* and *mounseyi*, and the recorded specimens of *punctulata* in the Vienna Museum, have been examined; for these I am indebted to Mr J. Huxley of the British Museum (Natural History) and Dr A. Kaltenbach, of the Vienna Museum, respectively. Apart from the descriptions and figures given in the present paper, a key to the species is included and notes on the specimens.

The specimens from Vienna consist of one male and one female, but although (Burr (1912:92) lists the male from Java and the female from Celebes, both are from this latter island, and the mention of Java is an error. The specimens are clearly conspecific with the type of *punctulata* on external characters.

Regarding the confusion about the status of *mounseyi*, it is worth noting that Burr regularly used the usual "sp.n." when describing any of his numerous new species, and the lack of this indication in the case of *mounseyi* appears to be due to the author being engaged on business other than entomology when the paper was in press. The three parts of the paper on the male genitalia of the Dermaptera were published in 1915 (parts 1 and 2) and 1916 (part 3), and it is in this last part that the name *Kinesis mounseyi* appears. The paper was communicated to the Royal Microscopical Society by Mr John Hopkinson, and evidently only the first two parts were checked in proof form by the author, for a footnote on the last page of the 1916 paper reads "As Captain Burr is with H.M. Forces somewhere in the East, and has been unable to correct the

revise (sic) of this part of his paper, it has been submitted to Mr Hopkinson". This evocative sentence conceals Burr's adventures in the Middle East during the first World War, when he appears to have developed such an interest in that region that his work on Dermaptera almost ended; very little was published by Burr on Dermaptera after that date. His interest in the Middle East or at least Eastern Europe, however, dates much further back than the first War, as related by him in his book "Slouch hat", but the interest seems to have become more dominant after that time, ending tragically in his death in a street accident in Istanbul.

The unfortunate result of this cessation of work on the Dermaptera is that a number of queries have remained unanswered, amongst them the case of *K. mounseyi*. No subsequent correction has been traced, but, in spite of the lack of indication in the 1916 paper, the name and the date must stand. The short description of two and a half lines entirely refers to the male genitalia, which is figured on plate II, figure 9, but this seems to be sufficient for the name to be valid. It may also be noted that Burr (1914) described *Nesogaster mounseyi*, also from the Philippine Islands, and collected by the same collector from the same locality as *Kinesis mounseyi*, and it is not known why this latter species was not described at the same time.

Key to species

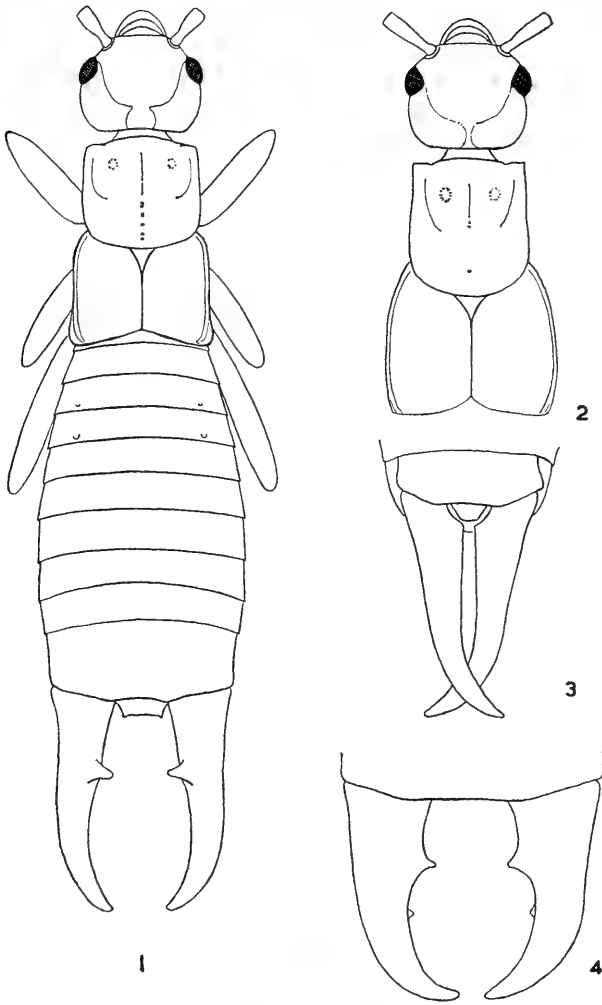
1. Pronotum transverse (fig. 1); abdominal puncturation somewhat weaker; paler species, smaller in size, body length less than 10 mm. Philippine Islands *mounseyi* Burr
- Pronotum longer than broad (fig. 22); abdominal puncturation rather stronger; darker species, larger in size, body length usually over 10 mm. Celebes *punctulata* Burr

Kinesis mounseyi Burr

Kinesis mounseyi Burr, 1916, J. R. micr. Soc. 1916: 9, fig. 9 pl. II (♂ holotype, ♂ paratype, Philippine Islands; British Museum (Natural History)).

Head reddish-yellow; antennae yellowish-brown, first segment darker; pronotum brown, lateral margins yellowish; elytra brown, somewhat translucent; legs yellowish; abdomen and forceps reddish-brown. Cuticle of head almost smooth and impunctate, that of pronotum and elytra coriaceous, impunctate; cuticle of abdominal tergites, except last, punctured on basal two-thirds or more, leaving a smooth posterior border, the punctures large and deep, separated by about their own diameter, and more marked on basal half of tergite, distal part having shallower punctures; last tergite almost smooth. Cuticle of head, and abdomen shining, that of pronotum and elytra duller.

Male (fig. 1): head transverse, swollen on occiput behind each eye, the swollen areas not touching on vertex but leaving



Kinesis:

fig. 1, *K. mounseyi*, male type; figs. 2, 3, *K. punctulata*, female type;
fig. 4, *K. punctulata*, male forceps.

a depressed area separating each area; eyes small. First antennal segment nearly as long as distance between the antennal bases, second segment transverse, third segment twice as long as broad or rather longer, fourth segment one and half times as long as broad, fifth segment intermediate in length between third and fourth; distal segments elongated, two and half times as long as broad, evenly narrowed to bases, apex rounded. Pronotum transverse, lateral margins slightly rounded, and with a rather wide explanate lateral margin; a well marked longitudinal median furrow present on anterior half of pronotum, the furrow much less marked on posterior half; two shallow circular depressions occur towards the anterior margin on each side of the disc. Elytra short, exposing a scutellum, each elytron with a well marked lateral explanate margin forming a lateral ridge. Legs with femora broadened,

second segment of tarsi produced beneath the third, tarsal segments with numerous short ventral hairs.

Abdomen broad, lateral tubercles on third tergite very small, those on fourth small; last tergite transverse, depressed medially near posterior margin, posterior margin slightly oblique laterally. Penultimate sternite with posterior margin almost evenly rounded, but with apex slightly truncate. Each branch of forceps elliptical in cross section basally and broader, arcuate, glabrous, and with a dorso-median tooth before midpoint. Pygidium short, transverse, declivent, postero-lateral angles slightly produced. Genitalia with short parameres, broader medially and narrowed towards apex, virga long and associated with two elongated dark sclerites. Length of body 9.75 mm., forceps 3.3-2.5 mm.

Female: unknown.

Material examined: ♂ holotype, ♂ paratype, Mindanao, P.I., Iodayi District, IX/X11 (Mounsey) (British Museum (Natural History)).

The paratype has longer forceps, and the genitalia figured by Burr (1916) is from the paratype.

Kinesis punctulata (Burr)

Chelisoches punctulata Burr, 1897, Ann. Mag. nat. Hist. (6) 20:315 (♀ holotype, Celebes; British Museum (Natural History)).

Kinesis punctulatus (Burr): Burr, 1912, Annln naturh. Mus. Wien 26: 92 (Java (in error); Celebes).

Generally dark reddish-brown, lighter when somewhat immature; antennae yellowish, first segment dark brown; legs yellowish-brown to dark brown. Cuticle similar to that of *mounseyi* but abdominal puncturation rather stronger.

Female: head transverse, lateral margins of occiput behind eyes slightly swollen; eyes small; proportion of antennal segments as in *mounseyi*. Pronotum slightly longer than broad, anterior lateral angles marked, somewhat acute; pronotum almost parallel-sided, posterior margin convex; elytra short (fig. 2). Abdomen broad, lateral tubercles on third tergite almost absent, those on fourth very large; last tergite transverse, small depressed near posterior margin between the branches of the forceps. Penultimate sternite extended in type, showing from a dorsal view-point (fig. 3). Each branch of forceps elliptical in cross section, excavated at base, evenly narrowed distally, inner margin slightly crenulated for basal half; apex curved medially; pygidium short, declivent, bluntly triangular (fig. 3). Length of body 11 mm., forceps 2.25 mm.

Male: similar to female; occiput behind eyes more swollen; abdomen broader, widened to last tergite which is very broad; each branch of forceps elliptical in cross section, arcuate, with small inner teeth and smaller isolated crenulations; pygidium not visible (fig. 4). Length of body 13.5 mm., forceps 3 mm.

Material examined: ♀ holotype, S. Celebes, Lompa-Battau, 3000' Marz, 1896 (British Museum) (Natural History)). Other

material: S. Celebes, Bua-Kraeng, 5000', Feb., 1896 (H. Fruhstorfer) (Coll. Br. V.W. 20.870) 1 ♂; Celebes, Loka (Sarasin) 1 ♀ (Vienna Museum).

The male from the Vienna Museum is large and dark, whilst the female is smaller (body length 10 mm) and lighter in colour, apparently being somewhat immature; the female specimen has lost the branches of the forceps but is otherwise in good condition.

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Manchester Museum.

Notes and Observations

DREPANA CURVATULA BORKHAUSEN: WAS THERE A SUFFOLK RECORD?—Further to my note in this journal (*antea*: 79) on the occurrence of a specimen of the Dusky Hooktip in North Norfolk in August 1971, I have come across an interesting reference to an alleged example of the Scarce Hooktip (*D. harpagula* Esp.) in the Memoirs of the Suffolk Naturalists' Society (1937). The compiler, Claude Morley, in his final catalogue of the Lepidoptera of Suffolk (p. 98), quoting from W. H. Harwood of Colchester, mentions that "that careful collector, Dr Free had a specimen in his collection which he said he took at Stowmarket: we all thought it was a variety of *P. falcula* until Mr Meek detected it when he purchased Dr Free's collection".

It seems extraordinary that such a "careful collector" as Dr Free should not have been able to distinguish between the Scarce Hooktip (*harpagula*) and the Pebble Hooktip (*falcula*) whereas the Dusky Hooktip (*curvatula*) could have been easily confused as a possible variety of the Pebble Hooktip, as I pointed out in my earlier note.

Suffolk also seems a most unlikely region for *D. harpagula* though Mr Morley says that its usual pabulum, the small-leaved lime, is found sparingly in the county.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 19.iv.1972.

NEPTICULA SORBI STANTON IN KENT.—On 29th May, I accompanied Col. Emmet and his wife to Goodley Stock near Westerham, to search trunks for the imagines of *N. sorbi* where Col. Emmet had last year noted the mines in plenty on *Pyrus aucuparia*. We only succeeded, however, in finding two moths, one at rest on a trunk of *P. aucuparia*, the other on a trunk of wild cherry. Both specimens appeared to have been out some time, so we concluded that a week or ten days earlier would have been about right for optimum emergence.—J. M. CHALMERS-HUNT. 1.vi.1972.

STIGMELLA OXYACANTHELLA STT. (LEP. NEPTICULIDAE).—Mr J. L. Gregory (*antea*, p. 76) states that he bred two of this species in August 1965 from larvae taken earlier in the same year, and a further example in June 1971 from a larva taken the previous October. He therefore concludes that *oxyacanthella* is bivoltine at his home in Cornwall. He kindly sent me the mine from which the 1971 moth was reared, and in my opinion it was undoubtedly made by *Nepticula pygmaeella* Haw. He is now of opinion that the pair he bred in 1965 are also *pygmaeella*. The two imagines can easily be confused unless both are present for comparison, when the deep purple of *oxyacanthella* contrasts strongly with the bronzy grey of *pygmaeella*. Mr Gregory says that he was misled by a passage in my *Notes on some of the British Nepticulidae* (*Ent. Record*, **83**: 164) which suggested to him that *oxyacanthella* was our only unfasciated *Nepticula* on hawthorn, and I must apologize for having drawn him into this error. I am writing this note at his suggestion.

Last year I first found the mines of *oxyacanthella* on the 29th of September and they continued until late October. I am still of the opinion that the species is univoltine and that the belief that it was bivoltine arose from the false attribution to it of the mines and larvae of *Stigmella crataegella* Klim. This year, after previous failures, I have succeeded in rearing twelve specimens of *crataegella*, which is a fasciated species closely resembling *S. hybnerella* Hübn. *S. crataegella* is also a univoltine species, but its larvae feed up two months earlier than those of *oxyacanthella*. It is a particularly hard species to get through, and most entomologists have failed. Hence they had no imagines to demonstrate to them that these earlier larvae produced an entirely different moth from the one they bred so easily from very similar October larvae. My *crataegella* emerged from the 5th to the 25th of May, whereas the first *oxyacanthella* appeared only two days ago (30th May). The *crataegella* were kept out of doors and so were unforced, while the *oxyacanthella* have been indoors and may be early. I doubt whether *oxyacanthella* flies before June or July in the state of nature. — A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 1.vi.1972.

PHYLLONORYCTER TRIFASCIELLA HAW. (LEP. GRACILLARIDAE) AN UPPER SURFACE MINE.—I was interested in Mr J. L. Gregory's note (*antea*, p. 78), since I have had a similar experience. In mid February of this year I had a brief holiday in the Isles of Scilly and found the mines of *P. trifasciella* locally plentiful in honeysuckle. Amongst them were three upper surface mines. These puzzled me and on my return I exhibited them at a meeting of the British Entomological and Natural History Society. I am ashamed to confess that I kept them in the same container as the normal *trifasciella* mines. From this material only *trifasciella* emerged, and it is reasonable to assume that my moths came from both varieties of mine.

The only other leaf-miners noted were *Nepticula aurella* Fab. and *Tischeria marginea* Haw. The latter species has not previously been recorded from Scilly.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 1.vi.1972.

THE OCCURRENCE OF CHLOROCLYSTIS CHLOËRATA MABILLE IN THE BRITISH ISLES.—This little insect which might aptly earn the soubriquet of the Sloe Pug, was first detected as a British species by Mr E. Pelham Clinton who bred out a couple of specimens from larvae beaten from sloe blossom in April 1971. This remarkable discovery naturally encouraged field collectors beat blackthorn blossom during April 1972 with the result that the very characteristic stumpy larva, almost white with a short red dorsal line, was found to be widespread in most areas where sloe was plentiful, ranging from Hampshire to Kent as well as occurring in some of the eastern counties. This clearly proved that the species had always been with us, but had apparently been overlooked owing to its similarity to *C. rectangulata* L. After I had my first specimen emerge on 16th May I compared it with my series of the latter species and to my astonishment found that I had in it four examples bred from Salisbury in May 1944 which seemed to conform in markings with *C. chloërata*. I duly took them to the Natural History Museum where Mr D. S. Fletcher confirmed my suspicions. Referring to my notes for 1944 I find I visited a large bank of sloe in Clarendon Park on 22nd April of that year, only arriving after dark so that I must have beaten the larvae using torchlight and designated them as *C. rectangulata* among which the imagines have remained undetected for 28 years. It would be most interesting if other examples of this little Pug are brought to light in this way, though as yet none appear to have been taken on the wing. The distinguishing features between the two species are best shown by the Danish author Henning Hansen in "Lepidoptera" (i:167, June 1969). Here the regular and rounded median band on the forewing of *C. chloërata* is shown as compared with the irregular and kinked one in *rectangulata* in which the line on the underside of the hindwing is much more acutely angled than the similar line in *chloërata*.—C. G. M. DE WORMS, Three Oaks, Woking. 18.v.72,

AN UNUSUAL GATHERING OF *GONEPTERYX RHAMNI* LINNAEUS IN SURREY.—A friend of mine, Mr Harry Hutchinson, reported an unusual local occurrence recently. He lives at Wanborough, just north of the Hog's Back and just west of Guildford. He is a reliable observer and, while he does not claim to be an entomologist, he does know the common butterflies of this country.

Over the Easter weekend (1st to 3rd April) he saw what must have been a most unusual sight at Wanborough. This is a rural area. His garden abuts on to about 100 acres of land which was originally a brickworks, long since disused, and said to have been the subject of litigation over many years. Hence not even grazing has taken place. The area is mainly grass with many weeds of many kinds and which has probably never been treated with any pesticides. There is a considerable amount of buckthorn and blackthorn as well as oak and ash, elm and hawthorn.

On this occasion, a cloudy bright morning, just before lunchtime, Mr Hutchinson was walking across this derelict land when he saw what he describes as a whirling mass of butterflies which he is sure were brimstones proceeding in the form of a cloud from south to north along a neglected hedge. The impression was one of a moving ball about the size of or a little larger than a football. He watched it proceed the whole length of the hedge before it disappeared from view. I have examined Mr Hutchinson very closely as to the number of butterflies he then saw. He is convinced that there were some twenty to thirty but, as he says, moving insects are not easy to count. However, after discussion we agreed that probably ten to twenty could have produced this effect.

The first thought was, of course, that this being a fine and warm morning a number of *rhamni* had emerged simultaneously and were enjoying the sunshine. But *rhamni* emerges in July and August and hibernates during the winter to be seen again the following spring. It is also unusual to see more than one or two of these butterflies at the same time—indeed the writer has never done so.

Could these frolicking insects have been *rhamni* and if so what were they doing. Could a single female have been the cause of the assembly. If so it is strange that, since so rarely are more than one or two seen at the same time, as many as, perhaps, ten had come together. Why?—A. G. M. BATTEN.

PAPILIO HOMERUS FABRICIUS.—We reported (*Ent. Record*, **80**: 5) our having seen this species at Good Hyde, near to the so-called Cockpit Country in the north of the island. We also said that we had seen the same insect come to exactly the same place at the same time of day for seven consecutive days.

I have now received a letter from Mr John Johnstone of Toronto, an amateur entomologist from this country, in which he writes as follows:—"We stayed at the Upper Deck Hotel,

Montago Bay, which is about 200 yards from the main road upon the hill overlooking the harbour. The first morning I got in the car and went a mile north where they had cleared ground and were building houses. The scrub had grown up and a few large trees still left. I found quite a few butterflies here, and over the week totalled about thirty species with three more seen but not taken. It was to this spot that I returned each day as it was easy to get to and from. It was at this spot that I caught a worn female *Papilio homerus*. She had not laid all her eggs and was duly released. She turned up again two days later at the same spot. I never saw a male, which was a great disappointment."—A. G. M. BATTEN, Littledale, Cedar Road, Hook Heath, Woking, Surrey. 15.v.1972.

HADENA COMPTA D. & SCHIFF.—I noted the Baron de Worms's comment (*antea* 79) on a northerly record of *H. compta*, the varied coronet. An interesting note on this species appeared in the News Letter of the Norfolk and Norwich Naturalists' Society for September 1969. In this, Mr Alec Bull had noted the varied coronet at Cranworth in 1963, and at Foxley, twelve miles north west of Norwich in 1969. I have taken the species both here, right in the centre of Norwich, and also at Surlingham, five miles to the east of the city in 1971. Doubtless the moth is widely distributed all over the county now.—T. N. D. PEET, 1a Glebe Road, Norwich, NOR 55F. 13.iv.1972.

CURIOUS BEHAVIOUR OF LARVA OF *ACHERONTIA ATROPOS* L.—Mr Sevastopulo comments (*antea* 114) on my observations of the behaviour of the brown larval form of *Acherontia atropos* L. This season, in Cape Town, I had six brown and ten yellow larvae under observation during their final instar. None of the brown ones showed the slightest inclination to hide during daylight—they rested more frequently than the yellow ones (which fed day and night non-stop) but remained at their feeding positions throughout the day.

Less than 4 per cent of the brown form observed over a period of some years buried themselves during the daylight hours, and therefore, to me, such behaviour cannot be classed as normal. Possibly climatic differences between Cape Town and Mombasa may account for the discrepancy in our observations on this subject.—H. L. O'HEFFERNAN, Salcombe, Devon. 9.vi.1972.

Current Literature

Jamaica and its Butterflies by F. Martin Brown and Bernard Heineman. Quarto, xv+478+11 Colour Plates, E. W. Classey Ltd., £16.50.

The long list of acknowledgements for assistance received by the authors shows that this book has not been brought into being lightly, but with all the available sources of information used to full advantage. There is a short foreword by Lord Caradon, a former Governor-in-Chief of Jamaica, on his

acquaintance with Bernard and Mrs Heinemann. The Author's introduction mentions many interesting facets of Jamaican life and mentions some butterflies said to have been seen in the island, but which have not yet been caught to establish their true determination.

Chapter I is headed The Jamaica Scene, and first mentions the West Indies and Jamaica's position in the group. The island is then described both as regards its division and its physical characters. Temperature and rainfall are mentioned, followed by vegetation and animals. Chapter 2 mentions a list of early collectors, commencing with the discovery of the island by Christopher Columbus and its early history. The collectors commence with Hans Sloan in 1687, followed by Peter Cramer, Philip Henry Gosse, E. Stuart Panton, George P. Longstaff, Lilly Perkins, Frank E. Watson, W. J. Kaye, C. C. Gowdey, A. Avinoff and N. Shoumatoff, and Ernest L. Bell. Present day collecting is the subject of Chapter 3, and localities for many species are mentioned.

After this, Chapter 4 gives a short note on butterfly anatomy and biology, with drawings showing wing areas and venation. Chapter 5 makes mention of the chief butterfly habitats with maps showing the wet and the dry season rainfall, an altitude chart and a vegetational map of the island.

The Zoogeography, is dealt with in Chapter 6, and there is a map of the Gulf of Mexico and the Caribbean Sea, showing the main currents and the prevailing winds. There is a check list of the butterfly fauna of the Greater Antilles, the species being listed in families with notes of their presence in or absence from Central America, Cuba, Hispaniola, Puerto Rico and Jamaica with comments at the end of each family. The chapter closes with two tables, Table 1 showing the number of species, totally endemic in Jamaica, and the numbers held in common with the various Antilles, and Table 2 showing the area and total number of taxa of Cuba, Hispaniola, Jamaica and Puerto Rico.

Chapter 7 is the main treatise, the families and sub-families being dealt with in turn, followed by their species. The details of the families and sub-families are explained with their taxonomy, and the species are dealt with with a few remarks on distinctive features, a good account of the taxonomy, their habits and habitats, life history, and distribution with a list of records. Dr J. L. Campbell has pointed out to me that no mention is made of his recording of *Spiroeta stelenes* L. from St Ann's (*Ent. Record*, 75: 73-76) although he presented the specimen to the Jamaica Institute on request, and a reprint of his article to the author. A short list of abbreviations used in the distribution records follows the text.

The ten plates follow, which, with the frontispiece, illustrate 116 species with 169 figures, all of them with the exception of *Papilio homerus* Fabricius on the frontispiece, illustrate the upperside on the left and the underside on the right. Sex

dimorphism and variation are shown where necessary. These beautiful plates are the work of **Mrs Marjorie Statham Favreau** and I would imagine that the printer has done justice to their excellent quality in the reproduction. One can well imagine the skill and patience displayed by Mrs Favreau in their drawing, and her attention to detail is truly remarkable.

After the plates come 29 pages of bibliography, a glossary, a checklist, and the index.

The book is printed in good clear type on good paper, and is strongly bound in grey-green buckram with gilt lettering on the spine. The front and back cover papers show a map of Jamaica with its counties, parishes, and principal collecting grounds.

The authors have set out to serve the interested layman as well as the scientific lepidopterist, and they have done very well for both causes. It is a book which must find its way into all institutions concerned with entomology, and into the hands of all interested lepidopterists likely to visit the island. With modern travel facilities, I should think many collectors may be persuaded to sample the Jamaican insects. Congratulations are due to all concerned; authors, artist, colour printers, printers and publishers.—S.N.A.J.

Obituary

EDWARD STUART AUGUSTUS BAYNES O.B.E., F.R.E.S.

By the death of Edward Stuart Augustus Baynes, which took place after a long illness at his home at Glenageary, Co. Dublin on 14th May, British Entomology sustained a sad, and Irish possibly, an irreparable loss.

It is true that he had reached an advanced age, but he showed no signs of this, and in appearance and energy until last winter had not seemed to have altered for the past twenty years. The writer had the pleasure of lunching with his wife and himself last June, on his eighty-second birthday, and noticed how little he had altered in the ten years we had been visiting Dingle together; further, he thought nothing of driving the 200 miles from Dingle to his home in one day.

Baynes was the son of Edward Neil Baynes, and grandson of Sir William J. W. Baynes, Bart, of a very old Yorkshire family. He was educated at Cheam and Radley, and after passing through the School of Architecture was working under Lutyens at the outbreak of the first world war. He at once enlisted in the Inns of Court O.T.C. and was commissioned to the Kings Royal Rifle Corps, but after being twice wounded was invalided home in 1916. After his recovery, he was attached to the Foreign Office, and travelled over most of the world. His thoroughness and gift for organisation caused him to be placed in charge of several exhibitions, notably at Johannesburg in 1936, Glasgow in 1937, and New York World Fair in the same year.

After the second world war he was attached to the British Embassy at Dublin as a Commissioner for British Trade from 1946 until his retirement in 1954.

Baynes began to take an interest in lepidoptera when at school at Radley and continued collecting both at home and abroad all his life. His Dublin appointment was, however, the critical point in his entomological career; he resolved to devote himself in future to Irish species, and sold his fine collection of British and European insects.

Apart from every year compiling a list of Irish immigrants for the Irish Naturalists' Journal, in which he enlisted the help of numerous correspondents, he early decided that it was time for a new book on the Irish macro-lepidoptera, on which no work had appeared since Donovan's Catalogue and supplement, which brought the data up to December 1936. Baynes went to work with his usual patience and assiduity. He not only went through all published sources, but also advertised in all the journals for information. All records sent in were most carefully checked, and when necessary, the insects seen.

In all his records he was as critical of others as he was modest over his own; any insect that seemed unlikely, or of an unusual form, was submitted to the B.M., the late Dr Cockayne, or the writer.

When he had finally collated his work, he submitted the entire type-script, which included spaces for notes, to Dr B. P. Beirne and myself, with instructions to point out any errors or make any additions necessary. I do not think I altered more than three entries, though I was able to add a few.

The final work appeared in 1964 and a supplement of additional records in 1970, and I think it gave general satisfaction.

Until last summer, Baynes was as keen as ever in the field, he was an ideal companion to collect with, never interfering or wishing to pack up early, and possessing a dry humour that amused if things were slow.

For several years after his retirement his wife and he spent the late winter and spring in the Canaries, and here also, he made many interesting captures.

His collection is to be presented to the Irish National Museum, so will always be available to future workers. He is survived by his widow and son, to whom the sympathy of all who knew him will go.—H.C.H.

Joint Committee for the Conservation of British Insects

BRITISH MACROLEPIDOPTERA : Rare and Endangered Species and Forms

The following list of species and named forms of British Macrolepidoptera includes those insects which the Joint

Committee for the Conservation of British Insects considers should be collected with restraint because they are rare and endangered. The list should be read in conjunction with the recent *Code for Insect Collecting*, issued by the Committee. The list contains one species, *Maculinea arion*, the Large Blue butterfly, which should not be collected at all. The Committee recommends that the other species and forms listed should be collected with the greatest restraint and suggests that a pair of specimens is sufficient. A few species are rare and endangered in only part of their range in the British Isles; these are noted in the list. Names of species follow the most recent editions of 'South'; they are listed alphabetically. More information is required on the status of many of the species mentioned.

BUTTERFLIES:—

Carterocephalus palaemon (Pallas). Chequered Skipper.
Coenonympha tullia (Müll.). Large Heath. In England.
Erebia aethiops (Esp.). Scotch Argus. In England.
Eumenis semele (L.) f. *thyone* Thompson. Grayling. This form only.

Hesperia comma (L.). Silver-spotted Skipper.
Lysandra bellargus (Rott.). Adonis Blue.
Maculinea arion (L.). Large Blue. Not to be collected.
Melitaea athalia (Rott.). Heath Fritillary.
Melitaea cinxia (L.). Glanville Fritillary.
Nymphalis polychloros (L.). Large Tortoiseshell.
Papilio machaon (L.). Swallowtail.
Plebejus argus (L.) f. *caernensis* Thompson, and *Plebejus argus* (L.) f. *masseyi* Tutt. Silver-studded Blue. These forms only.

Strymonidia pruni (L.). Black Hairstreak.
Thymelicus actaeon (Rott.). Lulworth Skipper.

N.B. Collection of *Lycaena dispar* Haw., Large Copper, at Woodwalton Fen is forbidden by the Nature Conservancy.

MOTHS:—

Acontia luctuosa (Schiff.). Four-spotted.
Acosmetia caliginosa (Hübner). Reddish Buff.
Aegeria chrysidiformis (Esp.). Fiery Clearwing.
Aegeria scoliaeformis (Borkh.). Welsh Clearwing.
Anepia irregularis (Hufn.). Viper's Bugloss.
Aplasta ononaria (Fuessly). Rest Harrow.
Arenostola extrema (Hübner). Concolorous.
Arenostola morrisii (Dale). Morris's Wainscot.
Aspitates gilvaria (Schiff.). Straw Belle.
Calophasia lunula (Hufn.). Toadflax Brocade.
Coenophila subrosea (Steph.). Rosy Marsh Moth.
Colobochyla salicalis (Schiff.). Lesser Belle.
Coscinia cribraria (L.). Speckled Footman.
Cosymbia pendularia (Clerck). Dingy Mocha.
Cucullia gnaphilii (Hübner). Cudweed.

- Cucullia lychnitis* (Ramb.). Striped Lychnis.
Drepana harpagula (Esp.). Scarce Hook-tip.
Emmelia trabealis (Scop.). Spotted Sulphur.
Endromis versicolora (L.). Kentish Glory.
Epicnaptera ilicifolia (L.). Small Lappet.
Epione verspertaria (F.). Dark Bordered Beauty.
Eriogaster lanestris (L.). Emall Eggar.
Euphyia luctuata (Schiff.). White-banded Carpet.
Eupithecia egenaria (H.-S.). Fletcher's Pug, Pauper Pug.
Eupithecia millefoliata (Rössler). Yarrow Pug.
Euplagia quadripunctaria (Poda). Jersey Tiger.
Eustroma reticulata (Schiff.). Netted Carpet.
Eustrotia bankiana (F.). Silver Barred.
Gortyna boreli (Pierret).
Hadena albimacula (Borkh.). White Spot.
Heliothis virescens (Hufn.). Marbled Clover.
Hydraecia hucherardi (Mab.). Giant Ear.
Hydrillula palustris (Hübner). Marsh Moth.
Idaea lineata (Scop.). Black-veined.
Lithosia pygmaeola (Doubt.). Pigmy Footman.
Lithostege griseata (Schiff.). Grey Carpet.
Luperina nickerlii (Freyer). Sandhill Rustic.
Malacosoma castrensis (L.). Ground Lackey.
Meliana flammea (Curt.). Flame Wainscot.
Nola albula (Schiff.). Kent Black Arches.
Nonagria algae (Esp.). Rush Wainscot.
Nonagria neurica (Hübner). White-mantled Wainscot.
Nyssia zonaria (Schiff.). Belted Beauty. In England and Wales.
Orgyia recens (Hübner). Scarce Vapourer.
Pachetra sagittigera (Hufn.). Feathered Ear.
Paracolax derivalis (Hübner). Clay Fan-foot.
Pareulype berberata (Schiff.). Barberry Carpet.
Pelosia obtusa (H.-S.). Small Dotted Footman.
Perizoma sagittata (F.). Marsh Carpet.
Phothedes captiuncula (Treits.). Least Minor.
Phragmataecia castaneae (Hübner). Reed Leopard.
Plusia chryson (Esp.). Scarce Burnished Brass.
Scopula immorata (L.). Lewes Wave.
Scopula nigropunctata (Hufn.). Sub-angled Wave.
Scopula rubiginata (Hufn.). Tawny Wave.
Sterrhia degeneraria (Hübner). Portland Ribbon Wave.
Sterrhia dilutaria (Hübner). Silky Wave.
Sterrhia ochrata (Scop.). Bright Wave.
Sterrhia vulpinaria (H.-S.). Least Carpet.
Thalera fimbralis (Scop.). Sussex Emerald.
Thetidia smaragdaria (F.). Essex Emerald.
Trisateles emortualis (Schiff.). Olive Crescent.
Zygaena exulans (Hoch. & Reim.). Scotch or Mountain Burnet.
Zygaena loti (Schiff. & Denis). Slender Scotch Burnet.
Zygaena purpuralis (Brünn.) f. *segontii* Tremewan. Transparent Burnet. This form only.
Zygaena viciae (Schiff. & Denis). New Forest Burnet.

(J. A. Parry). Pine Wood, common (D. G. Marsh).

4. Minster, four beaten from bushes, etc., July 9, 1915 (H. G. Gomm, *Diary*).

5. Chevening, July 12-21, 1913 (Gillett, *Diary*). Westerham (R. C. Edwards). Holwood (W. Barnes, in *Wool. Surv.*, 1909). High Elms, July 26, 1964 (R. G. Chatelain).

6. Shoreham* (Carr, *Entomologist*, 32: 40). Snodland*, 1908 (Ovenden, *Ent. Rec.*, 21: 32). Birling, 1911; Vigo Hill, 1924; Clay Lane Wood, 1912 (F. T. Grant). Gravesend (H. C. Huggins). Pinden district* (E. J. Hare).

6a. Darenth, 1865 (Fenn, *Lep. Data MS.*); (H. C. Huggins). Chatten-den (H. C. Huggins). Cobham Wood, 1912 (F. T. Grant).

7. Rochester district* (Chaney, 1884-87). Westwell (Scott, 1936).

8. Folkestone Warren (Knaggs, 1870). Near Nonington, 1912 (J. W. C. Hunt). Reinden Wood, abundant (Morley, 1931). Stowting; Brook*; Wye* (C. A. W. Duffield). Coombe Wood, Dover, one, June 26, 1895 (Stockwell, *Diary*). Alkham; Poulton; St. Radigund's; Whitfield (E. & Y., 1949). Elham Park Wood, three, July 6, 1926; Atchester Wood, 1931; Haddling Wood, June 29, 1938 (Busbridge, *Diary*).

10. Near Westerham*, abundant (Stephens, *Haust.*, 3: 214). Seal Chart, very common, July 20, 1888 (Fenn, *Lep. Data MS.*). Otford, not uncommon in willow plantation, July 7, 1956 (A. A. Allen).

11. Harrietsham, 1840 (Stephens, *Entomologist* 1: 200). Yalding (V.C.H., 1908). Aylesford (G. A. N. Davis).

12. Ham Street (Scott, 1936). Willesborough, 1956 (W. L. Rudland). Potters Corner, common; West Ashford, common (M. Singleton, M. Enfield, D. Youngs).

13. Tunbridge Wells district (Cox, *Entomologist*, 4 (62): ii). Tunbridge Wells, 1891 (Beeching, *Ent. Rec.*, 2: 229).

14. Hawkhurst, two, 1952 (B. G. Chatfield).

VARIATION.—The two sexes are quite dissimilar in appearance, and the normal ♂ and ♀ forms occurring in Kent seem to be represented by abs. *brunnescens* Lempke and *lutescens* Prout respectively, and the greyish nymo-typical *didymata* is apparently absent.

The following are in RCK:—ab. *flavescens* Lempke, 5 ♀♀, Sevenoaks, 1892, one ♀, Dover, 1909; ab. *brunnescens* Lempke, 8 ♂♂, Sevenoaks, 1892, one ♂, Dover, 1909.

FIRST RECORD, 1830: "Kent" (Curtis, *Br. Ent.*, 296).

***P. sagittata* Fabricius: Marsh Carpet.**

Resident?

It is hard to account for the appearance of this moth in the Dover-Folkestone area as there is no knowledge of any *Thalictrum* sp. there. On the other hand its occurrence near Wye appears significant, since of the few Kentish stations for *Thalictrum flavum*, several are located thereabouts in the valley of the Stour. Indeed, the possibility that *sagittata* may still persist there and to have been overlooked seems possible, for it is well known that the species is subject to long periods of decline during which it survives for many years at a low density level. The imago is extraordinarily retiring moreover, and despite its very striking appearance, is seldom seen in nature even in its most favoured haunts and during its years of optimum larval abundance.

8. Near Folkestone*, one, taken a year or two previous to 1888 (Mayor,

Entomologist, 60: 209). Dover, one "was taken in a back garden of a house in Maison Dieu Road, Dover, by myself in 1888" (Tulloch, *Entomologist*, 60: 163); "one specimen at Dover in 1885, according to Mr Webb" (V.C.H., 1908), probably refers to Tulloch's capture, despite discrepant dates (C.-H.).

12. Near Wye* (V.C.H., 1908).

FIRST PUBLISHED (A. C.) RECORD, 1908: Goss, in *Victoria County History of Kent*, 1: 192.

Eupithecia tenuiata Hübner: Sallow Pug.

Native. Woods, carr; on sallow.

1. Shooters Hill (J. W. Tutt, in *Wool. Surv.*, 1909). Bexley district (L. W. Newman, in *Wool. Surv.*, 1909). Bromley, July 28 (1), 30 (1), August 2 (1), 1962; 1964 (8), with max. (3) on July 16; 1965 (1); July 3, 1966 (1) (D. R. M. Long).

3. Wardwell Wood, larva; Bysing Wood, larva (H. C. Huggins). Pine Wood; Hospital Wood; Church Wood, larvae abundant in sallow catkins (J. A. Parry).

4. Ham Fen, one, July 3, 1960 (C.-H.).

6a. North Kent [Chattenden] (Tugwell, *Entomologist*, 8: 293). Chattenden Roughs, rare (Chaney, 1883-87). Cobham, July 14, 1912 (F. T. Grant).

7. Syndale Old Gravel Pit, imago (H. C. Huggins).

11. Hoads Wood, one bred, c. 1953 (P. Cue)†. Shipborne, imagines emerged June 1969, from sallow catkins collected in the spring (G. Haggett).

12. Ham Street (Scott, 1936); one, July 2, 1962 (de Worms, *Entomologist*, 96: 55); one, in Long Rope, July 28, 1962 (C.-H.).

14. Sandhurst, one in my coll. taken by G. V. Bull, June 26, 1946 (C.-H.).

15. Greatstone, two, July 23, 1963 (C.-H. and Wakely, *Ent. Rec.*, 76: 94).

FIRST RECORD, 1861: Cox, *Ent. week. Int.*, 10: 123. A more reliable record, however, dates from 1875: Tugwell, *loc. cit.*

E. inturbata Hübner: Maple Pug.

Native. Wood borders, hedges, copses; on maple.

1. Bromley, August 8 (1), 10 (1), 16 (1), 1964, August 13 (1), 15 (1), 17 (1), 18 (1), 19 (1), 24 (1), 1965, August 12 (1), 25 (1), 1966 (D. R. M. Long).

4. Ickham, one, c. 1956 (D. G. Marsh)†.

5. Westerham, several, 1947 (R. C. Edwards)†. High Elms, larva on maple (D. R. M. Long).

6. Greenhithe (Farn MS.). Fawkham, three, July 20, 1947 (G. Law)†. Pinden, one, August 12, 1953 (E. J. Hare)†. Shoreham, two, August 26, 1956 (C.-H.). Farningham, larvae fairly common, 1958 (A. J. Showler). Trottscliffe (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1962: 49).

6a. Chattenden, two larvae, May 25, 1962 (Showler, *Ent. Rec.*, 74: 246).

7. Westwell, two at m.v.l., August 9, 1955 (C.-H.) Note: The record in Scott (1964: 39) that I took larvae at Westwell, August 9, 1953, is manifestly erroneous (C.-H.).

8. Canterbury*, July 1864 (Piffard, in *Ent. Ann.*, 1865: 113). Wye (C. A. W. Duffield). Crundale, about 50 larvae beaten from maple, May 1947, reared; Bridge, larvae, c. 1947 (J. A. Parry). Ewell Minnis (E. & Y., 1949).

Brook, one, July 1959 (M. Singleton); a larva, June 3, 1968 (de Worms, *Entomologist*, **102**: 136). Chilham, numerous larvae beaten from maples, May 29, 1971 (R. F. Birchenough, C.-H., P. & C. Renshaw).

11. Aylesford, two, 1955 (G. A. N. Davis)†.

16. Saltwood, six or seven, 1862 (Knaggs, *Ent. mon. Mag.*, **2**: 93; Knaggs, 1870); Hythe (V.C.H., 1908), may refer. Sandling Park, about 36, July 27-August 2, 1865. (Knaggs, *Ent. mon. Mag.*, **2**: 93; Knaggs, 1870); Folkestone (V.C.H., 1908), may refer. West Hythe, one, July 23, 1947 (Morley, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1947-48**: 33). Saltwood, two, July 23, 1947, one, July 21, 1949, several larvae, May 22, 1950 (A. M. Morley).

FIRST NOTICE, 1862: Knaggs, *Ent. mon. Mag.*, **2**: 93.

E. haworthiata Doubleday: Haworth's Pug.

Native. Copses, wood-borders, hedges, gardens; on *Clematis vitalba*. Frequent on the chalk in 5-8, 6a.

Note: This species may be readily recognised in the imaginal stage, by the suffused pale reddish patch towards the base of the abdomen.

1. Old Park Wood, 1865; Bostall Wood, 1865; Dartford Heath, 1890 (Fenn, *Diary*). Forest Hill (Cansdale, *Ent. Rec.*, **2**: 69). Westcombe Park, common in gardens (Tutt, in *Wool. Surv.*, 1909). Bexley (L. W. Newman, in *Wool. Surv.*, 1909); (L. T. Ford). Birch Wood (C. Fenn, in *Wool. Surv.*, 1909). Sidcup, two, 1910, singletons 1913, 1920, 1922, 1931, larva, September 4, 1920 (Kidner, *Diary*). Dartford (B. K. West). Abbey Wood, 1957 (A. J. Showler). Blackheath, several, at m.v.l., 1959 (A. A. Allen). Orpington, 1956 (Siggs, in de Worms, *Lond. Nat.*, **1959**: 124). Bromley, 1959 (1), 1960 (1), 1961 (2), 1964 (6), 1965 (1), 1966 (1), with earliest date June 26, 1959 and 1960, latest date August 12, 1965, and maximum daily total (2) July 20, 1963 (D. R. M. Long).

2. Cliffe* (VCH., 1908). Dartford (B. K. West).

9. Margate, many from *C. vitalba* growing in garden, 1932, 1933 (P. F. Harris).

10. Sevenoaks, June 11, 1922 (Gillett, *Diary*).

12. Ham Street, one at light, July 1951 (C.-H.). Goldwell Quarry, larvae common on *C. vitalba*, many bred (P. Cue MS.).

13. Tunbridge Wells (E. D. Morgan).

15. Greatstone at m.v.l., July 20 (1), 23 (1), 1963 (C.-H. and Wakely, *Ent. Rec.*, **76**: 94). Boulderwall, Dungeness, July 1, 1966 (1) (R. E. Scott).

16. Folkestone (A. M. Morley).

FIRST RECORD, 1862: Strood, July 27, 1862 (Fenn, *Lep. Data MS.*).

E. plumbeolata Haworth: Lead-coloured Pug.

Native. Woods; on *Melampyrum pratense*.

1. West Wickham, one, June 1, two, June 29, 1861; Lee, June 12, 1861; Browns Woods, one, July 11, 1885 (Fenn, *Diary*). Bostall Wood, 1862 (Fenn, *Lep. Data MS.*). Hayes, 1901 (Hewitt, in *Wool. Surv.*, 1909). Bexley, 1926 (L. T. Ford); fairly common (B. K. West).

3. West Blean Wood, June 10, 1865 (Fenn, *Lep. Data MS.*); one, May 29, two, June 2, 1866 (Fenn, *Diary*). Faversham* (Morris, *Br. Moths*, **1**: 225). Blean Woods (H. C. Huggins); two, June 11, 1934 (T. G. Edwards, *Diary*); many, July 7, 1957 (R. F. Bretherton). Great Hall Wood, one, June 19, 1949; Thornden Wood, three, June 13, 1957; Church Wood, one,

June 15, 1957 (C.-H.). Thornden Wood, eleven larvae on *M. pratense*.
August 4, 1962 (G. M. Haggett).

6. Greenhithe* (Farn MS.).

6a. Between Dartford and Darenth Wood (see *First Record*). Darenth Wood, May 31, 1863, May 20, 1865 (Fenn, *Diary*); common, 1902-1910 (H. C. Huggins). Mark Oak Wood* (Chaney, 1883-87). Chattenden, one, June 18, 1884, three, June 20, 1891 (Fenn, *Diary*). [Chattenden] (Tugwell, *Entomologist*, **8**: 293); May 27, 1890; June 30, July 5, 1893, "undoubtedly second brood" (Tutt, *Ent. Rec.*, **1**: 64, idem, **4**: 249); 1908 (Ovenden, *Ent. Rec.*, **21**: 31).

8. Folkestone Warren (Knaggs, 1870). Near Swingfield, ♂, June 9, 1928 (Morley, 1931).

12. Ham Street, one, June 2, 1956 (R. C. Edwards); July 2, 1962 (de Worms, *Entomologist*, **96**: 55). Aldington, larvae on *M. pratense*, July 26, 1963, and in 1965 (P. Cue MS.).

14. Tenterden, common (Stainton, *Man.*, **2**: 85).

FIRST RECORD, 1831: "Found the end of May and beginning of June in abundance in the lanes leading from Dartford to Darenth-wood" (Stephens. *Haust.*, **3**: 287).

E. abietaria Goeze: **pini** Retz. nec L.: **togata** Hubner: Cloaked Pug.

Suspected importation. Ornamental gardens.

1. Lee, 1861 (see *First Record*). Bexley District (L. W. Newman, in *Wool. Surv.*, 1909).

6. Rosherville Gardens, Gravesend, one (in 1871) (Button, *Entomologist*, **5**: 393).

7. Sharsted, one, in 1925 or 1926 (H. C. Huggins).

[11. Marden (Morris, *British Moths*, **1**: 246). This is the basis for its inclusion in Knipe (1916); however, it is questionable whether this record refers to Kent as there is also a Marden in Herefordshire and a Marden in Wiltshire (C.-H.).]

FIRST RECORD, 1861: At Lee in 1861, "we were surprised to take a splendid specimen of this insect in Burnt-Ash Lane, on the 18th of June, mothing" (C. & J. Fenn, *Ent. week. Int.*, **10**: 196).

E. linariata Denis & Schiffermuller: Toadflax Pug.

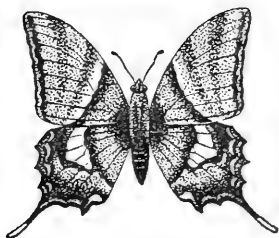
Native. Waysides, railway banks, waste places, etc.; on *Linaria vulgaris*, "Antirrhinum". Locally numerous and recorded from all divisions (except 4, 10, 16), but doubtless overlooked and likely to occur wherever *L. vulgaris* grows in any plenty.

The moth appears on the wing in June and early July, with apparently a second generation in late August and September.

As might be expected from its name, the normal foodplant is Toadflax (*L. vulgaris*), and there are many records of the larva on this in Kent; indeed, the species is most easily obtained by collecting the seed-heads into a bag in September and examining them a few days later for larvae. In addition to *L. vulgaris*, Chaney (1883-87) states that in the Rochester district it has occurred at New Brompton on Antirrhinum—presumably the introduced *A. majus* commonly found in gardens (C.-H.).

VARIATION.—In RCK is ab. *nigrofesciata* Dietze, one, bred Bexley, June 1905.

FIRST (PUBLISHED) RECORD, 1825: Castle Hill, Dover, 1820 (Curtis, *Br. Ent.*, **64**).



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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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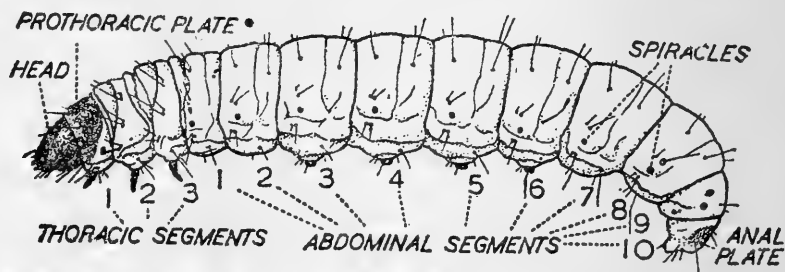
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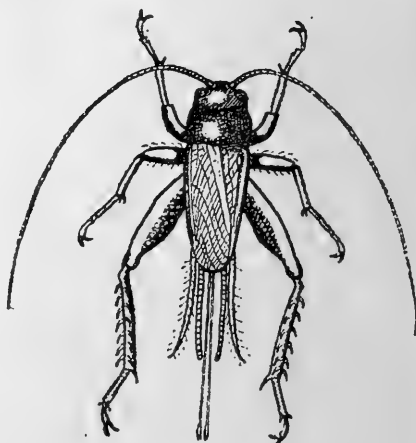
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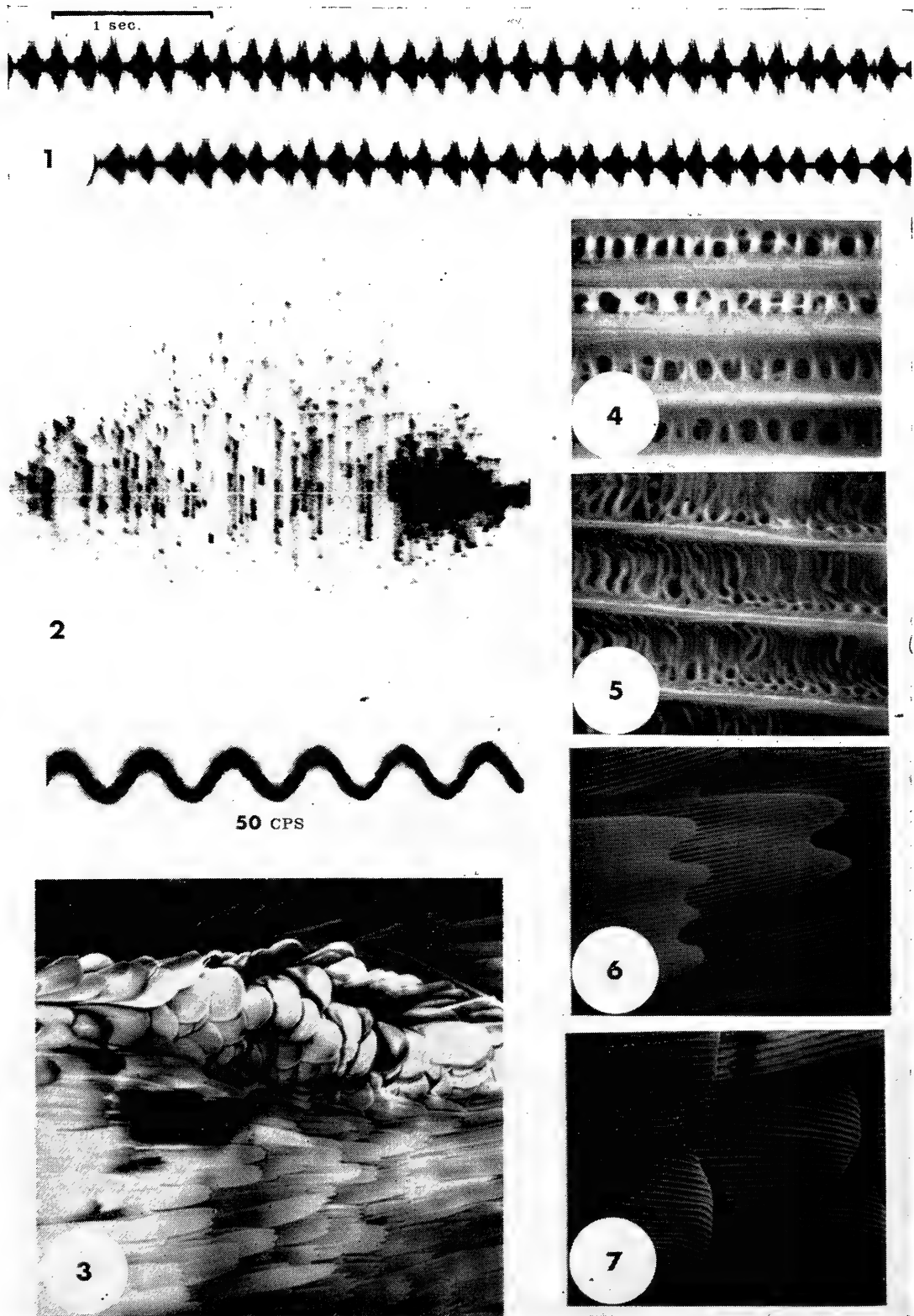


Fig. 1. Oscilloscope track of stridulation. Fig. 2. Single burst of noise, 50 cps wave for scale below. Fig. 3. Dorsal surface of valve of *P. jordana* showing a group of plectrum scales — ScEM x50. Fig. 4. Normal valve scale surface — Scale surface — ScEM x6000. Fig. 5. Plectrum-scale surface — ScEM x6000. Fig. 6. Normal valve scales — ScEM x600. Fig. 7. Plectrum-scales — ScEM x600.

Genital stridulation in male *Psilogramma jordana* Bethune-Baker (Lepidoptera, Sphingidae)

By GADEN S. ROBINSON

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AND

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Abstract

A recording of stridulation of a male *Psilogramma jordana* is analysed and characteristics of the sound are related to the morphology of the stridulatory organ. Stridulation is suggested to be of primary use in courtship behaviour, and as a defence reaction.

Keywords: Courtship, Behaviour, Stridulation, Lepidoptera, Genitalia.

Introduction

In a previous paper, (Robinson, 1969) the life history of *Psilogramma jordana* Bethune-Baker (Lepidoptera, Sphingidae, Acherontiinae) was described and a note made of its habit of stridulation. Subsequent to the publication of this observation, our attention was drawn to a paper by Van Doesburg (1966) in which observations by Muir (1908) and Mell (1902) of stridulation in *Psilogramma menephron* (Cramer) are quoted. Van Doesburg describes the stridulation mechanisms of a number of species of Sphingidae, amongst them *P. menephron*, and he gives excellent illustration of the stridulatory organs of the latter. We have examined the stridulatory organs of both *menephron* and *jordana* and can find no significant difference between the two.

The morphology of the stridulatory mechanism

Examination of a male *jordana* reveals one cluster of plectrum-like scales on the dorsal surface of each valve (pl. fig. 3): both clusters are brought into contact with a comb of spines on the posterior edge of the eighth tergite by lateral movements of the genital armature with the production of a characteristic "tss . . tss . . tss . . tss . ." noise. Bursts of noise have a frequency corresponding to that of movements of the genitalia.

A translation of Van Doesburg's comments on *menephron* reads as follows:

"The grater-scales of *Psilogramma menephron* Cram. are inserted on a very narrow spot on the dorsal vaulting of the valves and constructed as a rough rasp (figs. 17-18). The scales are symmetrical and flattened (fig. 19). The pars stridularis of the stridulation-comb consists of a large number of small, hard, needle-like spines which are inserted and ar-

ranged in regular fashion in rows on the posterior edge (of the eighth tergite) (fig. 21-22)."

On February 7th, 1970, H. S. R. recorded a male *jordana* stridulating, using a portable tape-recorder. The specimen had been attracted to black-light the previous night at Nandarivatu, Viti Levu, Fiji, and was resting on a wall. The senior author received the tape recording and the specimen some two months later.

Characteristics of the sound output

The tape recording made by H. S. R. was analysed using an oscilloscope. Plate fig. 1 shows a continuous recording of stridulation recorded from the oscilloscope screen on slow-moving film. Plate fig. 2 shows a single burst of noise recorded from a triggered sweep of 50cm./sec. . . From the continuous recording, bursts of noise were found to have a frequency of 5.77/sec. . . One burst "cycle" lasted a mean of 173m sec. of which 38m sec. was silence before the next burst of noise.

On the high-speed photographs it was possible to count individual peaks within a single burst. In six photographs (of which pl. fig. 2 is one) the number of peaks per burst of noise ranged from 140 to 230 with a mean of 193.

The noise output from a stridulating *P. jordana* is thus in the region of 193 peaks in 135m sec. corresponding to a frequency of 1,430 c.p.s. emitted in bursts of 135m sec. duration, each burst separated from the next by 38m sec. of silence.

Discussion

We believe that each peak within a burst represents a single tergal spine being struck by a plectrum-scale. In the preparation examined there are about 110 tergal spines of which 25 are set back and 85 which it is theoretically possible that a scale could hit. Presuming that the uppermost scale of each scale-patch strikes a spine, each spine would be hit twice in each lateral movement of the genital armature. This would give an expected output of 170 peaks per burst, consistent with the observed mean of 193.

We can add but little to the observations made in 1969 as to the reasons for stridulation in *Psilogramma*. The purpose of stridulation could be either defensive or it could normally be part of courtship behaviour.

Our translation of Van Doesburg's quotation of Mell's observation throws a little more light on the subject, at least with regard to *P. menephron*:

"I twice observed how the male flew round the female as an introduction to mating and made a perceptible noise. It (stridulation) may be interpreted causally as a noise of excitement which has later become an introduction to mating. It has no protective effect. I saw stridulating *Psilogramma* eaten by giant tree frogs . . . , birds . . . , shrews . . . , and bats." Mell's conclusions seem perfectly plausible although we are inclined to the opinion that stridulation is of a more defensive character

than Mell suggests. *Jordana* nearly always stridulates if provoked by rough handling and in this situation stridulation must be a defensive reaction. We have only Mell's observations on *menephron* as testimony to the ineffectual protection afforded by stridulation.

It is perhaps worthy of note that the surface sculpturing of normal scales on the genitalia of *jordana* and that of the modified plectrum-scales is dissimilar. Plate figures 4 and 5 are electron micrographs of the ridges on normal and plectrum-scale surfaces respectively at a magnification of $\times 6000$. Plate figures 6 and 7 show the scales and their ridges at $\times 600$ magnification.

Acknowledgements

Miss Linda Field gave invaluable help and advice during oscilloscope analysis of the tape-recordings. Mr Eric Henderson of the University of Durham Zoology Department Photographic Unit helped with photography. Dr Klaus Sattler of the British Museum (Natural History) Entomology Department provided the scanning electron micrographs. Mlle Dominique Frenot translated Van Doesburg's paper.

This paper was prepared during the tenure of a Science Research Council studentship by the senior author.

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Cupido osiris Meigen (*sebrus* Hb.) Observations on the Cohabitation of ssp. *sebrus* and ssp. *bernardiana* in the French Alpes

By M. J. PERCEVAL

Two subspecies of *Cupido osiris* Meigen occur in France, the larger more northern ssp. *bernardiana* Beuret and the smaller southern ssp. *sebrus* Hb. Bretherton (1) gives the respective ranges of *bernardiana* as the Alps and pre-Alps of Savoy and spreading into Switzerland in the Jura, Valais and Ticino, and of *sebrus* as the Basses Alpes and Alpes Maritimes, and reaching west of the Rhone into Ardeche, Gard and Herault.

The distribution, ecology and possible evolution of the two subspecies have been discussed at some length by Descimon (2). While he does not deal with the point of contact between them, he says that their taxonomic relationship should be looked at and that it would be interesting to study their intergrading and

possible co-habitation in the middle valleys of the Basses Alpes.

As a meeting point and the resultant population appear not to have been previously recorded or studied, the following observations may be of interest, especially in view of the rather unexpected results.

During July 1970 I took a short series of *osiris* from one restricted locality at a height of about 1750 metres some two miles to the south west of Col du Lautaret in the Hautes Alpes. An examination of these showed an unusual size distribution, 6 specimens being uniformly small and 11 much larger. I was able to return to the locality again in July 1971 and over a six day period I took and examined a further 74 specimens. These ranged in wing span from 22 mm.-35 mm. but again fell into two quite distinct size groups. Although the area is somewhat north of that suggested by Descimon, it appears that the population in this locality is a mixed one containing both ssp. *sebrus* and ssp. *bernardiana*.

My total sample of 91 specimens taken over the two years comprised 78 males and 13 females. The size distribution of the males is shown in fig. 1 (76, 2 having been removed for examination of genitalia). It can be seen that they fall into two distinct categories, 22-27 mm. and 29-35 mm., the average size in each being 25.4 mm. and 31.8 mm. respectively. The larger group appear to be typical *bernardiana* and the small group *sebrus*, although they are somewhat smaller than some *sebrus* from the Basses Alpes. Apart from the obvious size difference between the two subspecies, the only other distinction in the males is the degree of spotting on the underside hindwings. In this species some spots are almost always present, these are the single spot in 1b, the double spot in 1c, the discal spots in 4, 5 and 7 and the basal spot in 7. The discal spots in 2, 3 and 6, and the cell spot are much more variable often very much reduced or absent. In this population the tendency for incomplete spotting was however much more marked in *sebrus* than in *bernardiana*, in fact only two specimens in the sample of *sebrus* (10%) had the full compliment of spots compared with 27 specimens in the sample of *bernardiana* (50%). As would be expected, an examination of the genitalia showed no differentiation. The organs of *bernardiana* were slightly larger but without any material distinction.

Turning now to the much smaller sample of females, the size distribution is shown in fig. 2. Again they fall into two separate size groups, 26-28 mm. and 31-33 mm. The *bernardiana* females appear typical, although all of them have weak blue scaling at the base upper side extending in some cases to the middle of the forewings. The *sebrus* are however untypical. *Sebrus* generally has perhaps one of the bluest females of any *osiris* subspecies. Specimens without trace of blue scaling are rare and I was unable to find any in the B. M. collection which has quite an extensive series from the Basses Alpes. In my small sample however, of only 5 specimens 4 are completely black-brown, with no trace of blue, they are in fact

much more like the females of the Spanish subspecies *pseudolorquinii* than typical *sebrus*.

SIZE DISTRIBUTION OF SAMPLE

FIGURE I : MALES

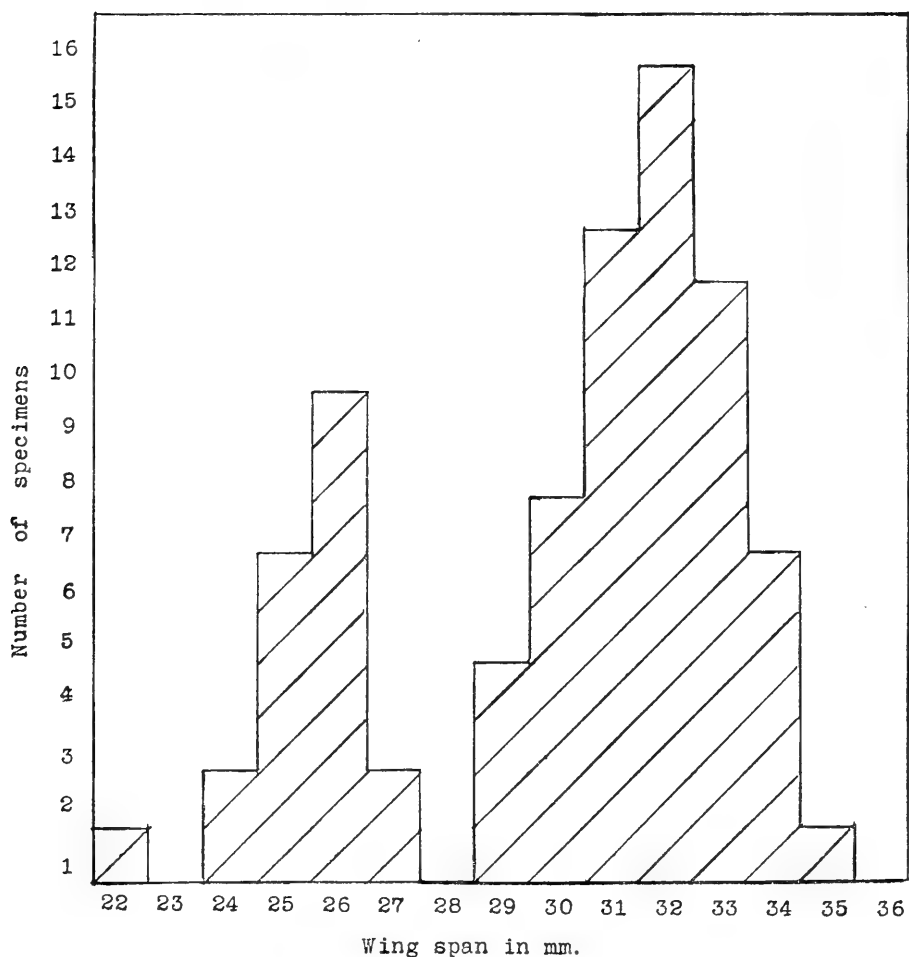
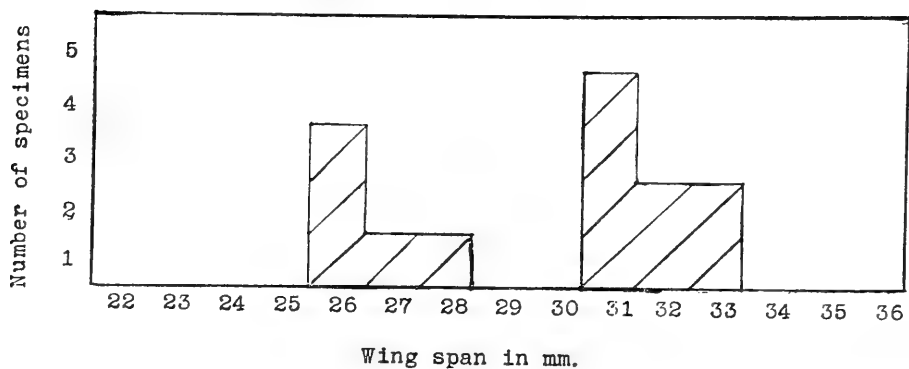


FIGURE II : FEMALES



It is clear from the foregoing description of the sample that *sebrus* and *bernardiana* seem able to co-habit and yet retain their independence. I can find no evidence to suggest the

existence of the intermediate population that one might expect in such circumstances. The two subspecies appeared evenly distributed in the small locality and were flying together. Both subspecies exhibited the same proportion of worn and fresh specimens indicating that no difference existed in their time of emergence. A number of individuals were observed in copulation but always with members of the same subspecies.

The sample was taken over two years but mostly at one time. It is therefore an indication of the status of the two subspecies in the locality only at a point in time. It shows the population as 73% *bernardiana* and 27% *sebrus*. Although *bernardiana* predominates in a ratio of almost 3-1, both appear well established. Further examination of this population will be needed to show if the relationship between the subspecies is static or in a state of change.

It would seem from the evidence of this population that these two subspecies of *osiris*, while obviously closely related, do not produce a cline or even any recognisable intermediate population where they meet. They can coexist together, both maintaining their independence and separate identity. Although they seem to have every opportunity they appear either not to interbreed, or if they do, with insufficient fertility. This unusual situation would appear to merit further consideration.

It may be noted that my measurements are different from those given by Beuret (3). He gives *sebrus* as 22-26 mm. in the males and 23-25 mm. in the females as against 27-30 mm. and 25-27 mm. respectively for *bernardiana*. Bearing in mind that my *sebrus* were somewhat smaller than average, the difference would be accounted for if Beuret's measurements were taken on the basis of direct wing expanse rather than the method I adopted, apex to centre of thorax X 2.

Finally a note on nomenclature. Higgins and Riley (4) by suppressing *sebrus* as the specific name seem to have left the subspecific nomenclature in some confusion. As Hubner gave no type locality for his *sebrus*, that of Boisduval's later work, namely St. Maximin Var, was accepted. However, as Meigen's *osiris* probably came from Vienna, it now seems incorrect to continue to consider ssp. *sebrus* as the type, especially, as according to Beuret the subspecies from the two areas differ markedly. I have thus continued to refer to the subspecies from the South of France as *sebrus*.

I should like to thank Mr R. F. Bretherton for his invaluable help with information from earlier works on this species, especially that of Beuret and Descimon. I should also like to thank Dr L. G. Higgins who examined the genitalia of specimens from both subspecies in my sample.

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Collecting in Jamaica : September and October 1971

By C. G. M. de WORMS and T. J. G. HOMER

Part I by Dr de Worms:

Having sampled the lepidoptera of two of the most prolific islands in the Caribbean chain, Grenada and above all Trinidad, in the spring of 1968 (*Ent. Record*, **81**: 33), I had an urge to visit some further rich regions in that delectable part of the New World. Jamaica was an obvious choice what with its very luscious and wild vegetation and stories of the fabulous endemic *Papilio homerus* L. by far the largest and in many ways the most spectacular true Swallow-tail in the Americas. The opportunity to visit this wonderful island arose through the most kind and cordial invitation of Dr Charles Goodall and his wife who had recently migrated there from England to take up a medical practice at Port Antonio on the north-east coast. Mr Theodore Homer, who had already been to Jamaica by sea on two previous occasions, arranged to coincide with my arrival in early September by travelling out in one of the banana-carrying ships which also accommodates a few passengers.

I flew out from Heathrow on the morning of 7th September direct to Bermuda where after a brief stop we continued the 3500-mile journey to Kingston, arriving there at 4 p.m. local time with the thermometer standing at 92°F in the shade. Dr Goodall had kindly sent a car to meet me at the airport situated on a tongue of land reclaimed from the sea on the south side of the famous harbour. We then travelled by the coastal road the 80 miles to Williamsfield some three miles east of Port Antonio where, as dusk was falling, I had a warm welcome from Charles and Helen Goodall as well as from Theodore Homer who had arrived the previous day. En route we had seen the devastation wrought in the cocoanut groves by the virus disease which affects the stem and causes the whole tree to wilt and die.

Williamsfield House which was to be my haven for the next fortnight was situated on an eminence at the edge of the former virgin forest within half a mile of the sea. It was almost surrounded by an orchard of bananas and other fruit

trees, some bearing delicious grapefruit, with a grand panorama in the background of the whole range of the Blue mountains. But from the collecting stand point a bank at the bottom of the garden some 150 yards long which had been allowed to get covered with thick low vegetation and flowers, seemed to attract most of the butterflies in the vicinity. In fact of all the spots we visited in that neighbourhood it appeared to have the biggest concentration of day-flying species. We were able to sample them first on the morning of 8th September under a blazing sun and with a temperature of some 90°F in the shade. It was interesting to observe the behaviour of the several different butterflies. Among the commonest was the large yellow *Phoebis sennae* L. with its paler female dashing about over the herbage and bushes accompanied by the glorious large orange *Colaenis julia* F., known as the Flambeau, skimming at great speed and most difficult to net. Another spectacular insect was the delicate green and almost black *Metamorpha stelenes* L. as it sailed round the larger trees, usually settling high up on a leaf and often returning to the same perch. But the aristocrats of this large assemblage were *Papilio andraemon* Hübn., a black and gold, a species which apparently invaded Jamaica from Cuba as recently as about 1945 and has now displaced several other species of *Papilio* in some regions of the island, since the larvae infest citrus trees. This fine butterfly used to flutter momentarily over a spike of small blue flowers and was by no means easy to catch. Other Nymphalines included swarms of *Precis lavinia* L. which sped about close to the ground and again were most dodgy to net as was also the biscuit-coloured *Anartia jatropha* L., a widespread species throughout the Caribbean, like the fiery *Agraulis vanillae* L. looking something like a European Fritillary. Other regular inhabitants of this rich spot was the small endemic Nymphaline *Mestra dorcas* Cr., several species of the small Pierids, the Euremas *E. lisa* Bov. and *E. nise* Cr. and the large-tailed Skipper, *Urbanus proteus* L. That afternoon our hosts took Theo Homer and myself by car to Moor Town at the foot of the Blue Mountains near to one of the localities for *P. homerus*, but this grand insect was not forthcoming. However, butterflies which we had not seen earlier that day included *Calisto zangis* F., the only Satyrid on the island, and an endemic Jamaican species flying with the well-known and widespread small Blue, *Hemiargus hanno* Stoll.

For night operations we discovered a remarkable source of attraction for the local moths in the shape of two powerful mercury vapour standard lamps with the light only five feet from the ground. These and other lights were the main illumination of the luxurious Dragon Supermarket, recently constructed, which was floodlit nightly as a precaution against pilfering. This most fortunate site was virtually at the foot of the garden at Williamfield House and could also be reached by a short walk down the drive and along the main coastal road.

It served as a wonderful source for night-flying species and in particular the large Sphingids. On our first evening, September 8, we found several *Manduca brontes* Drury and the smaller *Xylophanes tersa* L. There was also a fine assortment of noctuids and Pyrales together with many species of the Bombycid families. One especially prevalent outsize member of the Ophderinae group of Noctuids was *Teinoletis simoenta* Guen., a species virtually confined to the northern islands of the Caribbean. Another very good venue for moths were the lights on the verandah at our host's house and also those in rooms when lights were left on after dark. A full list of captures at these various spots is given at the end of this account.

On 9th September I explored the rough forest country down the drive from Williamsfield House. A charming little butterfly which was notably prevalent in this region was the small Nymphaline *Dynamine egaea* F., an endemic Jamaican species in which the sexes are remarkably dimorphic. So much so that they were at one time considered to be separate insects. The male is iridescent green, while the female is brown with broad white bands. The 10th was another blazing day when we saw the first *Heliconius charitonius* L., that graceful purple and yellow insect which glides round trees and bushes and especially on the slope at the base of Dr Goodall's garden where Mr Homer also took a *Danaus gilippus berenice* Cramer, by no means common in this terrain. That afternoon we accompanied our hosts first into Port Antonio and then on inland to Mount Pleasant where on some virgin ground *Agraulis vanillae* was swarming.

The next two days, which were again very hot, were spent in and around Williamsfield House where *Papilio andraemon* and *Metamorpha stelenes* had become increasingly numerous, while some traps containing squashed mango and banana attracted the tailed *Anaea portia* F. and the huge black noctuid *Ascalapha odorata* L. September 13 saw us exploring forest ground above our hosts' garden where other local residents had large villages and bungalows. Most of the butterflies already mentioned were well to the fore, especially *H. charitonius*, while Mr Homer found a pair of *C. julia* in cop. That evening we found no less than five species of Hawkmoths including some of the largest insects in the New World such as *Neococytius cluentius* Cr. measuring nearly 7 in. in expanse with the not much smaller *Manduca albiplaga* Wkr.

On 14th September Charles Goodall conducted Theo Homer and myself on an all-day expedition into the Blue Mountains. After travelling some distance along the northern coast road which crosses the Rio Grande by an imposing bridge, we struck inland up a narrow winding road through wild country with a gradual ascent. At a promising spot en route we made a halt by the roadside where we found some long grass alive with *Calisto zangis* which were very dodgy to catch. Two *Euremas* which we had not come across previously, were also flying with

them. They were the handsome orange *E. proterpia* F. with small tails, *E. dina* Doey and the small *Natholis iole* Bdv. all usually associated with high altitudes. But unfortunately the weather deteriorated when we reached the divide at Hardwar Gap with the road descending direct to Kingston. But during a short interval of sunshine we distinctly saw the very local transparent *Ithomiine*, *Greta diaphane* Drury sailing about among very thick herbage. The next couple of days, which were again very warm with very heavy rainstorms, were devoted to collecting in the vicinity of Williamsfield House where butterflies seem to be becoming increasingly plentiful. We found the tiny Blue *Leptotes cassius* Cr. quite numerous, but very difficult to follow among the thick vegetation. Again moths were also in quantity at the Supermarket lights including a spectacular Hypsid which had large "windows" in all its wings. Apparently several have been taken in various parts of Jamaica, but as yet it has remained undescribed. It is unlike any other species of this large family. On 17th September Theo Homer and I concentrated on some open ground in a field running alongside the drive to the main road. This spot produced a lot of *P. andraemon*, *C. julia* and *Dynamine egaea*. The afternoon we accompanied our hosts once more to the further side of Port Antonio in the direction of Mount Pleasant. We found some rough ground bordering a side road where the Fritillary-like *Euptoieta hegesia* Staud. was especially numerous gliding over and settling on flowers along the road. In the more wooded parts of this area *H. charitonius* was also in comparative plenty with several of the little *Dynamine egaea* and many *C. zangis*.

The next day, the 19th, under rather dull conditions we were driven by our host in a jeep into the afforested parts of the Sansan estate bordering the coastal road southwards. Here again we saw a goodly assortment of nearly all the species with which we had become familiar, especially *C. charitonius*, and *C. julia* and *A. vanillae*. In a local garden we found several spectacular larvae of *Pseudosphinx tetrio* L., nearly full-fed, devouring hibiscus. That night at the Supermarket lights we saw two of the huge hawkmoth *N. cocyti*us, also the beautiful *Sphingid*, *Amplypterus gannascus* Cr. of which the Jamaican race *f. jamaicensis* is much more heavily marked than the forms found on the South American Continent. I spent my last full day at Williamsfield House, on 20th September, surveying the usual run of butterflies in and around the garden, in particular the various species of *Eurema*, of which *E. lisa* Bdv. and *E. nise* Cr. were the most prevalent.

Early on 21st September I left this lovely region with a heavy heart after its wealth of lepidopterous fauna and the kindness of Charles and Helen Goodall who drove Theo Homer and myself to a spot along the coast road south called Rosselle Falls, about half way to Kingston. Here we were met by Dr Tom Turner of the University of the West Indies, probably the

leading active collector in the island. He took us to some glorious ground just off the main road where we collected in ideal conditions. The wooded region was alive with butterflies including several species we had not previously met with. Early in the proceedings we took three new *Euremas*, the grand large orange *E. nicippe* Cr. and two very similar kinds. *E. elathea* Cr. with a straight dark bar on its pale yellow forewings, while in its close relative *E. दौरα* Godart the bar is distinctly curved. A fine inhabitant of this rich locality was *Papilio thoas* L., while *Anaea portia* was to be seen dashing about the high trees, and plenty of *H. charitonius* were sailing about the lower herbage with a good many *C. julia* and *A. vanillae*. Blues and Skippers were also very much in evidence, especially *Pyrgus oileus* L. A very well-marked form of the White *Ascia monuste eubotea* Godart was also on the wing. In the afternoon we went to Dr Turner's house where he showed us his superb collection of Jamaican butterflies. We all then went on to spend the evening with Mr David Hopwood at his home among the hills overlooking Kingston. He too showed us some of his fine captures including *P. homerus*. After being lavishly entertained by our hosts the Goodalls and Theo Homer set out for Port Antonio, while I repaired to the Mona Hotel in the capital, the garden of which was full of Pierids on the morning of 22nd September, chiefly *Phoebis sennae*.

That afternoon I flew to Montego Bay whence after a brief halt I continued my flight to New York, eventually going on to stay with Mr Cyril Dos Passos, the eminent American collector, in New Jersey, then to Toronto the first days of October. I got back to England the middle of that month after a most successful and enjoyable round trip. Mr T. Homer, who stayed a further two weeks in Jamaica, appends his narrative for the period after I left.

(to be continued)

"The Worst June on Record": Light Trap Results for Lepidoptera

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

A great dearth of lepidoptera has been obvious to the most casual observer in southern England in June 1972. For night-flying species the records of my light trap at Bramley, give some measure of this dearth in relation to past years.

The table below shows the average numbers of individuals and species of Macro-lepidoptera and Pyrales recorded nightly for the four "quarters" of June from 1964 to 1972. The trap has been operated throughout the period in the same spot, amid surroundings which have changed very little, and standard techniques have been used for counting and recording attendances and for noting the maximum and minimum temperatures between dusk and dawn, together with cloud, wind and moon conditions. The records are thus comparable from

year to year as far as they go. There are, however, in some years lengthy gaps, so that no averages can be given for some quarters. Between these, a few nights have been missed for accidental reasons in other quarters. These latter amount, however, only to 26 in all — about 12% — and in no quarter exceed three nights. The nightly averages for each quarter shown are therefore not likely to be far wrong.

AVERAGE NIGHTLY NUMBERS OF MACROLEPIDOPTERA AND PYRALES

Recorded in light trap at Bramley, Surrey, in June, 1964-1972.

Individuals and (in brackets) species

	1st to 8th	9th to 15th	16th to 23rd	24th to 30th	Whole month
1964	85 (37)	149 (50)	105 (36)	248 (65)	140
1965	n.a.	118 (42)	144 (36)	243 (49)	—
1966	58 (30)	131 (52)	107 (39)	78 (44)	96
1967	68 (32)	55 (21)	72 (31)	106 (33)	75
1968	78 (33)	167 (49)	n.a.	n.a.	—
1969	n.a.	n.a.	102 (31)	138 (44)	—
1970	231 (60)	563 (79)	n.a.	n.a.	—
1971	84 (30)	77 (27)	91 (29)	117 (37)	92
1972	22 (15)	22 (14)	29 (16)	33 (21)	26

It will be seen that for all four quarters of June 1972 the nightly numbers both of individuals and of species fall far below those of the corresponding quarters — and, indeed, of *any* quarters — in all other years since 1964. The numbers of individuals were only between a third and a quarter, and of a species about half, those of 1971, which was itself rather a poor year. For 1970, which was generally one of the most prolific years of modern times, records are only available for the first half of the month. For this the contrast with 1972 is spectacular; more than forty times as many individuals and four times as many species. The year most resembling 1972 was 1967; but even this averaged thrice as many individuals and twice as many species per night. The best single night scores in June 1972 were 72, of 40 species, on 30th June and 58, of 25 species, on 21st. These may be contrasted with the record of 790 moths, of 102 species, on 11th June 1970.

Within the puny total of 800 moths recorded in the whole of June 1972 (less than in March or April) it could not be expected that any species would show a good year; but some of the usually common species seem to have been much less reduced than others — notably *Laothoe populi* L., *Spilosoma lubricipeda* L., and *S. lutea* Hufn., *Diarsia mendica* F. (*festiva* Schiff), *Ochropleura plecta* L., *Plusia pulchrina* Hubn., *Lithina*

chlorosata Scop. The only local rarity seen was a battered and barren female *Eupithecia irriguata* Hubn.; this species has never visited the trap before, and its nearest haunt known to me is 5 miles away. On the other hand, it has been a relief that *Agrotis exclamationis* L., which usually provides about a third of the total attendance in June, this year scored only 93 examples, with a maximum of 17 on 21st.

Maximum (usually dusk) night temperatures in all quarters in June 1972 were below those of the corresponding quarters in all other years, in most cases by substantial amounts. The average for the whole month was only 50·0° F., as compared with 56·3° F. in 1966 and 58·4° F. in the first half of June 1970. Average minimum temperatures, at 43·9° F. for the month, were also lower than in other years for each quarter except for the third quarters of 1967 and 1969; but the deficiencies in the minima were less than in the maxima because of the very frequent cloud cover in 1972.

It would be rash or, at least premature, to conclude that the extremely low trap attendances in June 1972 reflect a real decline in the moth population. Certainly over short periods trap results do not necessarily reflect its size at all closely: the moths may be there, but they do not come to the trap because of low mean night temperatures, the presence of a moon, wind, etc. Moreover, it is clear that the low temperatures of June 1972, by day as well as by night, following upon a very unfavourable May, have held back emergences of most species: it does not follow that it has prevented them altogether. Nevertheless, the effects on the *future* population of the continuous bad weather in May and June may well be disastrous. If moths do not come to the light-trap, this is because they are not flying freely or far; and if they do not fly they cannot feed or pair. Further, even if emergences are merely delayed abnormally, this means for many species that second broods will be small and for others that the appropriate stage of larval or pupal development will not be reached before the winter. It will be interesting to see how far such effects can be traced in trap recordings or by other means later on.

Folly Hill, Birtley Green, Bramley, Surrey. 3/7/72

CELERIO GALII ROTT. IN SUFFOLK. — While collecting at Walberswick on 14th July 1972, in company with Messrs R. Birchenough, G. Chipperfield and P. and C. Renshaw, I caught a fine specimen of *Celerio galii* Rott. fluttering along the path through the reeds, near the pilot light of my generator at 0030 hours. The wind was N.E. force 2-3.

Mr C. Renshaw took a second specimen at his m.v. light about ten minutes later. He also caught *Pyrausta perlucidalis* Hübn. near the landward side of the reed beds, the determination being confirmed by Mr Chippenfield.—E. H. WILD, 112, Foxearth Road, Selsdon, Croydon CR2 8EF. 19.vii.1972.

On two new races of the genus *Zygaena* Fabricius from Asia Minor (Lep. Zygaenidae)*

By HUGO REISS & GÜNTHER REISS

1. *Zygaena* (*Agrumenia*) *formosa* Herrich-Schäffer ssp. **bernhaueriana** n. ssp.

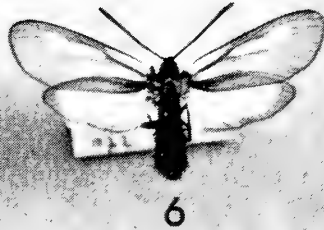
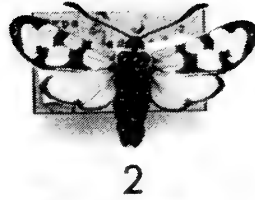
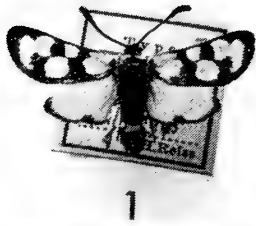
Zygaena formosa H.-S. (1852; 1851. figure) is illustrated in Seitz, *Die Gross-Schmetterlinge der Erde* 2 (1907) and is dealt with further by H. Reiss in the Supplement to the work of Seitz (1930) 2:22 and (1933) 2:269. H. Reiss (1935), in describing the ssp. *kotzschii* Reiss from Khash Khash Dag, Aghri Dag, 3,200 m, West Armenia, quoted the original description of *Zygaena formosa* Herrich-Schäffer from Amasia, Pontus; there the date of the original description is erroneously cited as 1845, which should be corrected to 1852. The ssp. *malatiana* Rebel (1901) from Malatia, Taurus was also dealt with by H. Reiss (1935). Haaf (1952) figured the male genitalia while those of both sexes were figured by Alberti (1958; 1959). We do not possess specimens of ssp. *hadjinica* Holik & Sheljuzhko (1958) (= *hadjinensis* Holik & Sheljuzhko (1956)) from Hadjin, Taurus; it was described from 6♂♂, leg. Manissadjan, 1886, in coll. Staudinger, as follows: "These examples approach the west Armenian subspecies but differ in the red coloration which is more inclined to carmine. Quite characteristic is the basal half of the hindwings which is more thickly scaled than the apical half. The hindwing border is better developed than that in the nominate race and in specimens from Malatia. The abdominal belt is simple, partly reduced." Tremewan (1970) described the ssp. *eximia* from Ankara: Balâ, south of Ankara, ca 1000 m, 13♂♂, 4 ♀♀, 11-13.7.1969, and from Ankara: Beynam, south of Ankara, ca 1000 m, 3♂♂, 12-16.7.1969, leg. Tremewan and Cottrill. Wingspan ♂ 22-26 mm, ♀ 24-27 mm. We have for comparison 2♂♂ 1♀ of the type series. Further, 1♂ 1♀ of *eximia* from Beynam, 14.7.1971, leg. K. Bernhauer, in coll. H. Reiss.

From eastern Turkey, north of Tunceli, ca 25 km south of Pulümür, 1500m, 25-29.6.1971, leg. D. & K. Bernhauer, we have 6♂♂ that differ from all known subspecies. We name this race after the collectors: **bernhaueriana** n. ssp. Wingspan ♂♂ 25-26 mm. Compared with *eximia* Tremewan the patagia is more whitish. The whitish surrounding of the tegulae is hardly evident. The abdominal belt, which in *eximia* is distinct light carmine red on two segments, is in all specimens strongly restricted and dusted with dark scaling; in 4♂♂ the abdominal belt is quite lost on the upperside and on the underside it is in the form of only a very narrow red band. Compared with *eximia*, the legs are distinctly darkened. The red of the fore-

*The systematic arrangement follows Reiss & Tremewan (1967).

Corrected lines 7 and 8 for page (88) of Lepidoptera of Kent

FIRST (PUBLISHED) RECORD, 1908: Goss, in *Victoria County History of Kent*, 1: 192.



- Fig. 1. *Zygaena formosa kotzschii* Reiss, Holotype ♂, wingspan 26 mm.
 Fig. 2. *Z. formosa bernhaueriana* n. ssp., Holotype ♂, wingspan 25 mm.
 Fig. 3. *Z. formosa bernhaueriana* n. ssp., Paratype ♂, wingspan 25 mm.
 Fig. 4. *Z. formosa bernhaueriana* n. ssp., Paratype ♂, wingspan 26 mm.
 Fig. 5. *Z. osterodensis ikizderica* n. ssp. Holotype ♂, wingspan 31 mm.
 Fig. 6. *Z. osterodensis ikizderica* n. ssp., Allotype ♀, wingspan 32 mm.
 Fig. 7. *Z. osterodensis ikizderica* n. ssp., Paratype ♂, wingspan 34 mm.
 Fig. 8. *Z. osterodensis ikizderica* n. ssp., Paratype ♀, wingspan 32 mm.

wing spots and the hindwings is a warm light carmine, hardly different from that of *eximia*. The yellowish white edging of the forewing spots is distinctly narrower, compared with *eximia*; in 2♂♂ it runs along the costa from spot 1 to 3. A light carmine red spot 2a is found in 5♂♂, and in 1♂ the spot 2a is yellowish. This spot (2a) is placed against the dorsum through the yellowish white line, as in *eximia*. The underside is similar to the upperside. Holotype ♂, wingspan 25 mm, and 5 paratypes ♂♂ in coll. Reiss.

The figures show the form and size of the antennae, the wing shape, the spot size and edging, likewise the hindwing border.

Zygaena formosa ssp. *bernhaueriana* n. ssp. is different:

(a) from *formosa formosa* H.-S. from Amasia through the darker legs, the strongly reduced red abdominal belt, the less marked white edging of the tegulae and the narrower edging of the forewing spots;

(b) from *formosa hadjinensis* Holik & Sheljuzhko from Hadjin, Taurus, and *malatiana* Rebel from Malatia, Taurus, through the darker legs, the reduced abdominal belt and the somewhat colder red coloration;

(c) from *formosa kotzschii* Reiss from Khash Khash Dag, Aghri Dag, 3200 m, of which the holotype ♂ is figured, through the light blue sheen on the forewings, the more whitish appearance of the tegulae, the warmer carmine red spots with well represented, not rudimentary, edging; further by the enlarged spots 3 and 4 which are not separated by the dark ground colour.

2. *Zygaena* (*Zygaena*) *osterodensis* Reiss ssp. *ikizderica* n. ssp.

Following the genitalia studies by Tremewan & Reiss (1964), the distribution of *Zygaena osterodensis* Reiss (*scabiosae* auct.) was shown on a map which also shows the distribution of *Zygaena romeo* Duponchel and *Zygaena nevadensis* Rambur. *Z. scabiosae* Scheven is a race of *Zygaena purpuralis* Brünnich from Regensburg, Germany. From Achalzich, Adshara Mountains, Georgia, Transcaucasus, ssp. *caucasi* Burgeff (1926) (= *caucasica* Spuler (1906), locality Caucasus) was described. Whether the original series of *caucasica* Spuler actually belong to *osterodensis* Reiss or to *Zygaena mana* Kirby (= *erebus* Staudinger) can no longer be ascertained, as the types cannot be found. H. Reiss (1930) dealt with ssp. *caucasi* Burgeff in Seitz, *Die Gross-Schmetterlinge der Erde*, Supplement 2:10 under *scabiosae* and figured a ♂ ex coll. Burgeff on plate 4n. Holik & Sheljuzhko (1955) give under *scabiosae* a description of *caucasi* from 17 ♂♂, 3 ♀♀ without collecting data from the neighbourhood of Borshom, Georgia: "As large as central European specimens but with broad very rounded apexes of the wings. The pattern is almost identical with that of the German races. The inclination towards broken streaks is only

small (1♂). The hindwing border is evenly broad. The scaling is fairly dense, the red a dull carmine. Antennae thick, with strong rounded clubs." In addition Holik & Sheljuzhko (1955) wrote that these specimens were not different from those that Burgeff described from Achalzich. The thickened antennae that both authors described could not be confirmed by us.

In coll. Reiss is 1♂ labelled Caucasus, that belongs to ssp. *caucasi* Burgeff. Wingspan 29 mm. The thorax and abdomen show no visible hairs. The antennae are thin and weakly clubbed. The wings are rounded at the apexes. The black ground colour is without gloss. The light carmine red streaks are separated from one another by the black veins. The carmine red coloration of the hindwings is scarcely luminous. The hindwing border is broad and fairly even to the tornus.

From a locality about 20 km south of Ikisdere, south of Rize in north-east Turkey, 1900 m, we have 15♂♂, 2♀♀, 6-10.7.1971, leg. D. & K. Bernhauer and 1♂, 1♀, end of July, 1971, leg. Schubert, that we name after the locality ssp. *ikizderica* n. ssp. Holotype ♂, wingspan 31 mm, allotype ♀, wingspan 32 mm, and paratypes in coll. Reiss.

Wingspan 1♂ 29 mm, 7♂♂ 31 mm, 5♂♂ 32 mm, 1♂ 33 mm, 1♂ 34 mm, 1♂ (crippled); 1♀ 30 mm, 2♀♀ 32 mm. The ground colour of the antennae, head, thorax and abdomen is black with a light blue gloss; the abdomen is distinctly haired. The antennae in the ♂♂ are distinctly more strongly clubbed than those of the ♀♀. The legs are black with bluish gloss; the hind legs lack the medial spurs. The dull ground colour of the forewings is almost without gloss. The dark hindwing border is broad, strongest at the apex and reaching the tornus. The fringes are black, darker than the ground colour. The forewings are rounded at the apex. The red of the forewing streaks and of the hindwings is darker in the males than in the females. The streaks of the forewings are similar in shape and size to those of central European *osterodensis*. Streak 1 extends along the wing as far as spot 3, but remains separated from both spots 2 and 3 by the dark veins. The streak comprised of spots 2-4 is often somewhat narrower in the middle and remains separated from the streak comprised of spots 3-5 by the dark ground colour. The apical streak (spots 3-5) has the elongate spot 3 connected to spot 5 in almost all specimens. In 3♂♂, 2♀♀ the apical streak (3-5) is completely broken by the dark ground colour. The underside of the wings is as the upperside, the streaks are sometimes somewhat diffuse.

The genitalia of 1♂ were prepared by Mr Fr. Heller of the Museum of Natural History in Stuttgart, and agree with the genitalia illustrated by Alberti (1958; 1959) under *scabiosae*. We are most grateful to Mr Heller for his work.

The illustrations show especially the size of the wings and antennae, the forewing streaks and the breadth of the hindwing border.

The new subspecies differs from ssp. *caucasi* Burgeff from Achalzich in Georgia in the larger wingspan, stronger pubescence of the thorax and abdomen and the forewing streaks.

Holik & Sheljuzhko (1955) record under *scabiosae* 1♂ 1♀ from Sarykamys (formerly Province Kars), 17.6.1913, leg. Tkatschukov (coll. Sheljuzhko) for the West Armenian zone of the Asia Minor region.

We thank Messrs Dieter and Konrad Bernhauer for collecting the material and presenting it to us. It is their special efforts which has made these two new subspecies available to us. Likewise we thank Mr Schubert for his friendly help.

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Notes and Observations

EUPLAGIA QUADRI-PUNCTARIA PODA: EVIDENCE OF LOCAL MIGRATIONS.—The Jersey Tiger is perhaps most usually caught fluttering in broad sunlight around flowers or bushes in late August or September in Europe, often in small congregations of up to a dozen. In the Le Havre district (North Central France) I have in two successive years taken it to light in damp habitats at the foot of southward-facing cliffs between Le Havre and Tancarville: on the second occasion (mid August 1971) as many as ten individuals came to the sheet in a single hour. In these two localities, which were comparatively sheltered and warm, searching at night for the larvae in early summer 1971 and 1972 was fruitless, but on 5th May 1972 a larva was found on nettle at night on rough weedy ground near the sea below the cliffs of Cap de la Hève; this site is exposed, bleak and quite treeless, and is separated by five and fifteen miles respectively from the two localities where the adults flew. Though I worked Cap de la Hève in August and September I never took the adult there.

Most collectors who have reared this species have done so from ova obtained from females; a few, however, have found the larvae wild, but those whom I have questioned say they have not found the larvae in the same place that they found the imago plentiful in. It would be interesting to know whether this is invariably so, which might be considered evidence that throughout its range this moth tends to congregate for sexual maturation and mating in localities widely separated from its breeding-ground, as in the extreme case at Rhodes. Its behaviour there has only been solved recently: it congregates in masses at Petaloudes, after migrating inconspicuously from its breeding grounds 26 km. away, as established, after a 15-month research, by R. Elger. (See R. Elger, 1969: *Frielandstudien zøur Biologie und Oekologie von Panaxia quadripunctaria* (Lep., Arctiidae) auf der Insel Rhodos. *Oecologia*, **2**: 162-197: Berlin; reviewed by Naumann (1968) 1969 in *Zeits. Wien. ent. Ges.*, **53**: 99-100.)—E. P. WILTSHIRE, 23 avenue Foch, Le Harve. 30.v.1972.

EUPLAGIA QUADRI-PUNCTARIA PODA: UNUSUAL POLYPHAGY.—The food plants given by various authors for the Jersey Tiger are nearly all herbaceous: *Taraxacum officinale*, *Lamium album*, *Urtica* sps., *Nepeta hederacea*, *Senecio jacobaea*, *Borago officinalis*, *Plantago* sps., *Epilobium* sps., and so on; bushes mentioned by some authors are *Rubus idaeus*, *Sarothamnus scoparius*, and *Ribes grossularia*. The recorded foodplants have, to my knowledge, not hitherto included forest trees.

On 5th May 1972 I found a larva of this species at night feeding on stinging nettle (*Urtica dioica*); *Rubus* and *Senecio* grew near by but no trees. The larva was put in a cage with a fine upstanding stinging nettle and also a yellow archangel,

(*Galeobdolum luteum*), and some sprays of oak (*Quercus* sp.) and beech (*Fagus sylvatica*), all in water pots to maintain freshness. The floor of the cage was of earth and still strewn with fallen ragwort (*Senecio jacobaea*) seeds from 1971, in a dry condition. On the first day of captivity the larva ate only these seeds, but on the six subsequent days it ate large amounts of oak and beech foliage and nothing else, despite availability of the foodplant on which it was found feeding. On 12th May it ate a little *Urtica* and *Galeobdolum* but quickly returned to beech leaves on which it fed copiously. On 14th May it became restless and stopped feeding; it buried a few days later. This larva's preference for two hitherto unrecorded foodplants, not available where it was found, seems to merit publication. The larva's polyphagy appears to be even wider than hitherto suspected.—E. P. WILTSHIRE, 23 avenue Foch, Le Havre. 30.v.1972.

HOMOEOSOMA SAXICOLA VAUGHAN (LEP. PHYCITINAE)—In late June 1964 I noticed signs of larval feeding in the flowers of Chamomile plants growing near the harbour wall at Par. In these I found two kinds of larvae, the one dipterous and the other lepidopterous. Over the next two weeks I collected a few further flowers for rearing purposes.

I noticed that while the diptera seemed to occur indiscriminately in all parts of the flower except the petals, the lepidoptera seemed to prefer the middle of the flower, and, when resting, in the hollow at the top of the stem just below the flower.

During August 1964 moths and flies began to emerge together, and with the help of the key in Beirne's British Pyralid and Plume Moths, I was able to determine the moths with reasonable certainty as *saxicola*.

In the summers of 1965 to 1970 I frequently searched chamomile flowers on many parts of the Cornish coast, but failed to find *saxicola* larvae again for six consecutive seasons. Whether the larvae were really absent, or whether I had just failed to find them for reasons of time or place, I do not know. However, in late July 1971 and throughout August I was pleased to re-discover larvae in quite a number of coastal localities, all within a few feet of the sea and some actually on the shore. Larvae were particularly abundant at Kiberick Cove, near Nare Head, and at Constantine Bay on the North Coast.

The larvae varied from light greenish to purplish brown, with dark dorsal and sub-dorsal lines, the dorsal being darker than the sub-dorsal. The under surface varied from pale green to pale brown.

The 1971 larvae had all become purplish brown and appeared to be full-fed by late August or early September and I was able to photograph them at this stage. Each larvae constructed a substantial blackish coloured cocoon with a few supporting strands of black silk, reaching about half an inch

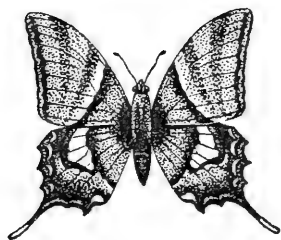
away. Most of these cocoons were at the top or bottom of the jars in which the larvae were housed, only a few spinning up amongst the flower heads. During the winter of 1971-72, several of the cocoons produced hymenopterous parasites.

In May 1972 I was surprised to find a small greyish-green larva walking about in one of the jars. It was only about half the size it had been when it ceased to feed at the end of the previous summer, and had reverted in colour to that of a half-grown larva. Within the following three weeks other larvae had abandoned their winter cocoons, by which time the first larva had constructed a second cocoon, light greenish grey this time, more compact and without the supporting strands. One by one, the other larvae did likewise, after refusing the fresh chamomile which I had offered to them. Some of these second cocoons were quite substantial, while others were so flimsy as to be almost non-existent so that the light yellowish brown pupa could be easily seen inside. The first moth appeared on 1st or 2nd July and others are still appearing.

My observations agree with Ford in his Guide to the Smaller British Lepidoptera, but it seems that the species may be either univoltine or bi-voltine in Cornwall; a subject for further investigation. — JOHN L. GREGORY, Lepidoptera House, Bodelva, Par, Cornwall. 9.vii.1972.

PHYLLONORYCTER RAJELLA L. (LEP. GRACILLARIIDAE) IN HAMPSHIRE — On the 6th of November, 1971, I was in the vicinity of Petersfield. At the bottom of a steep-sided chalk pit, I found several trees of *Alnus incana* heavily mined by a species of *Phyllonorycter*, several leaves containing two or three mines. I took 40 mines, and earlier this year, I was pleased to have 22 moths duly emerge. The moth was unknown to me, but was identified by Mr S. N. A. Jacobs as *Phyllonorycter rajella* L. This is I believe, a new county record for Hampshire. — S. E. WHITEBREAD, Grove Farm, Higham, Kent. 13.vi.1972.

PARASCOTIA FULIGINARIA L. ON THE MIDLAND (BIRMINGHAM) PLATEAU — I should like to put on record the capture of a female specimen of the Waved Black Moth (*Parascotia fuliginaria* L.) which came to m.v. light on the night of 24th July 1971 at Randan Wood, Worcestershire, and from which I obtained eggs. This capture surely confirms the very early, but previously unconfirmed report of this species being taken *circa* 1860 at Croome in Worcestershire, which is only 17 miles from the forementioned locality. It would appear from other records that this species occurs all along the Severn Valley in suitable places from the Shropshire/Worcestershire border southwards. I purposely withheld the information until I had looked for larvae in the area in which it was captured, but although I have searched several times for it since April, I have been unlucky. I am now looking forward to bred examples of the moth from the three hammock-like cocoons, and three nearly full-fed larvae which I have at the time of writing. — L. J. EVANS, 73 Warren Hill Road, Birmingham B44 8HA. 15.vii.1972.



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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

with the assistance of

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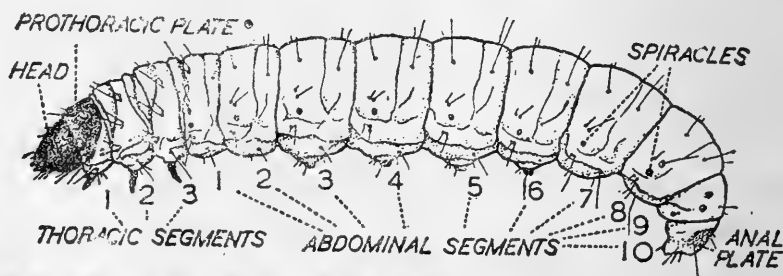
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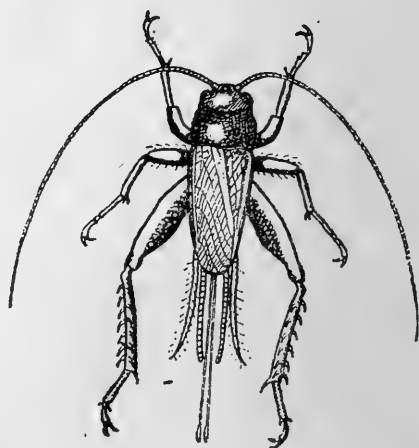
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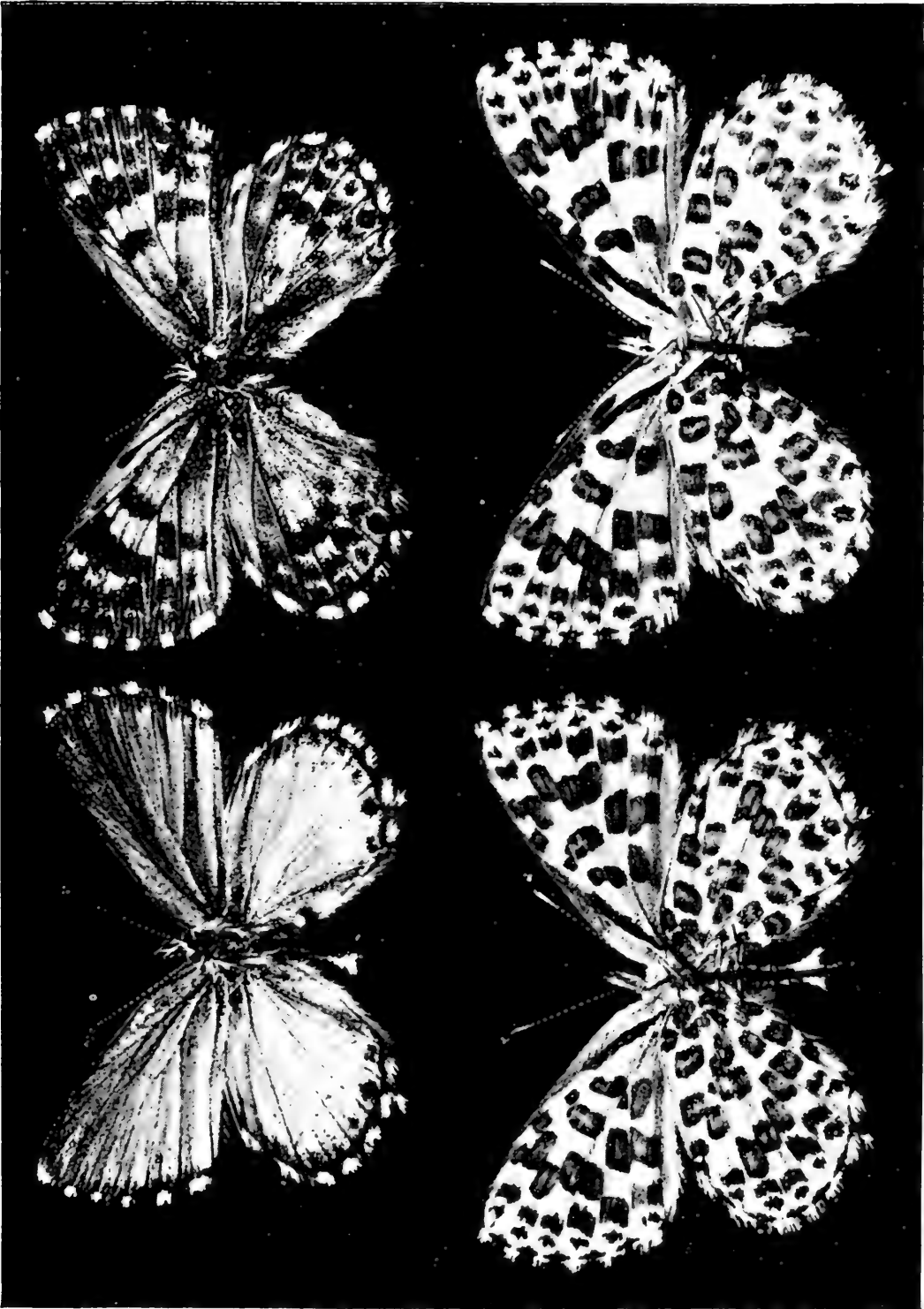
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Tarucus boukeri transvaalensis ssp. nova.

Upper Figs.:

Holotype ♂, upperside and underside.

× approx. 2.63.

Allotype ♀, upperside and underside

Lower Figs.:

× approx. 2.65.

Notes on *Tarucus bowkeri* (Trimen) (Lepidoptera: Lycaenidae), with a description of a New Subspecies

By C. D. QUICKELBERGE
East London Museum

Discovered by J. H. Bowker in 1881 near Inchanga, Natal, this interesting "blue" has generally been considered local and uncommon. Although its classic habitat is the uplands of Natal, it has only comparatively recently been found to have a much wider distribution in South Africa, ranging from the far northern parts of the Transvaal and down along its eastern escarpment, then on through Natal, finally reaching as far south as Port St. Johns in the eastern Cape Province. The most recent discovery of *T. bowkeri* by C. W. Wykeham in December 1970, on the Blaauwberg Mountains about 170 miles further north of its nearest known Transvaal locality on the Drakensberg mountain range, came as a great surprise. This is because the intervening country between the Drakensberg and Blaauwberg is unsuitable to the species and, although the Blaauwberg and the nearby Zoutpansberg mountains are at present isolated ranges, this discovery gives every indication of former links between these and the Drakensberg escarpment of the eastern Transvaal along which *bowkeri* occurs.

However, our present knowledge of its entire distribution is still rather sketchy and its known localities are few and far between. Even in well-known spots the species cannot always be relied upon to show itself. Certain unfavourable seasons seem to reduce populations of colonies to such low levels that the collector sometimes fails to locate specimens.

From information gathered a somewhat clear picture of the ecological requirements of *T. bowkeri* has emerged. Some altitude (perhaps only well above 1,000' a.s.l.), rather precipitous, rocky ground and some proximity to forests appear to constitute the most favoured habitat. Here it may be found singly and flying about at random, attracted to flowers growing amongst the herbage or between rocks. According to Mr C. G. C. Dickson (in litt.) *bowkeri* does not stray far from its foodplant; at least this was his experience with the species near Inchanga. Generally considered only to occur about inland spots, it came as an interesting surprise when in September 1964 the author found *bowkeri* on the summits of the high cliffs at Port St. Johns situated within a mile or two of the sea. However, this area is unusual in that other species normally only associated with inland mountainous areas also occur here, such as *Papilio euphranor* Trimen and *Charaxes xiphares* (Cramer). A possible explanation accounting for this phenomenon lies in the existence of a high-lying area of ground, referred to as the Pondoland coastal plateau, which

projects right down to the coast at Port St. Johns. The eventual linking up of this fairly high table-land with more elevated mountain chains of the interior, has no doubt enabled such inland butterfly species to so closely approach the sea at this point.

T. bowkeri is multi-brooded and so has a prolonged flight period, extending practically throughout the year, but doubtless occurring in lesser numbers during the colder months.

The early stages of *T. bowkeri* have been well documented by Clark and Dickson (1971) in their monumental work "Life Histories of the South African Lycaenid butterflies."

Tarcus bowkeri transvaalensis SSP. NOVA

Lycaena bowkeri Trimen. Trans. Ent. Soc. Lond., 1883: 351.

Material

Holotype: Male, Kawyn's Pass, Graskop, Transvaal, 26 December, 1970 (J. C. McMaster).

Allotype: Female, Kawyn's Pass, Graskop, Transvaal, 26 December, 1970 (J. C. McMaster).

Paratypes: 7 males and 4 females, of which 5 males and 3 females are from the type-locality, collected 19/12/63 and 26/12/1970, and one male and one female from the Blaauwberg, Transvaal 12/12/1970. The remaining male was caught by Mr K. M. Pennington at Mnt. Sheba, Transvaal on 3/2/1968.

The holo- and allo-types are in the Transvaal Museum's collection, while 4 male and 2 female paratypes (also topotypes) are in Mr W. Henning's collection. A further pair of topotypes is in Mr McMaster's collection, while the Mnt. Sheba male is in Mr Pennington's collection.

Description

Holotype: Upperside blue more extensive and saturated than in the nominate subspecies; also rather purer in hue, less tinged with violaceous. Blue areas of wings are immaculate except for marginal markings and slightly darkened veins whereas in the nominate race there are some specimens displaying a varying development of discal spotting, while dark markings closing the cells of each wing are a constant feature of all specimens. Veins not quite as clearly demarcated as in nominate *bowkeri* and the underside colouring is colder. Underside markings show through wings.

UpFw.: Blue covers nearly the entire wing surface except for a narrow hind-marginal blackish edging which is irregular and narrowing at veins. This border, hardly a millimetre in width *T. b. transvaalensis*, is generally about twice as wide in *T. b. bowkeri*. Cilia checkered with white in the internervular spaces. No dark spot closing the cell as in *T. b. bowkeri*.

UpHw.: Blue covers most of the wing area except for the inner margin and costa, these parts being dusky

but liberally dusted with greyish-white on inner-margin. Hind-marginal dusky spots are present in areas 1c to 6 of which the largest and darkest is in area 2. Except for the cilia, no sign of white markings on the wing, whereas in most specimens of *T. b. bowkeri* there is a white irregular marking on the margin of area 7 and sometimes an indistinct similar one in the same position in area 6. In addition most of the specimens have all or some of the marginal spots in areas 1 to 3 variously bounded with white.

Short white-tipped tail at end of vein 2. No spot closing the cell.

Underside: As in nominate subspecies but the creamy ground colour is lighter, almost white, while the spots are distinctly greyer, not so warmly brownish-tinged.

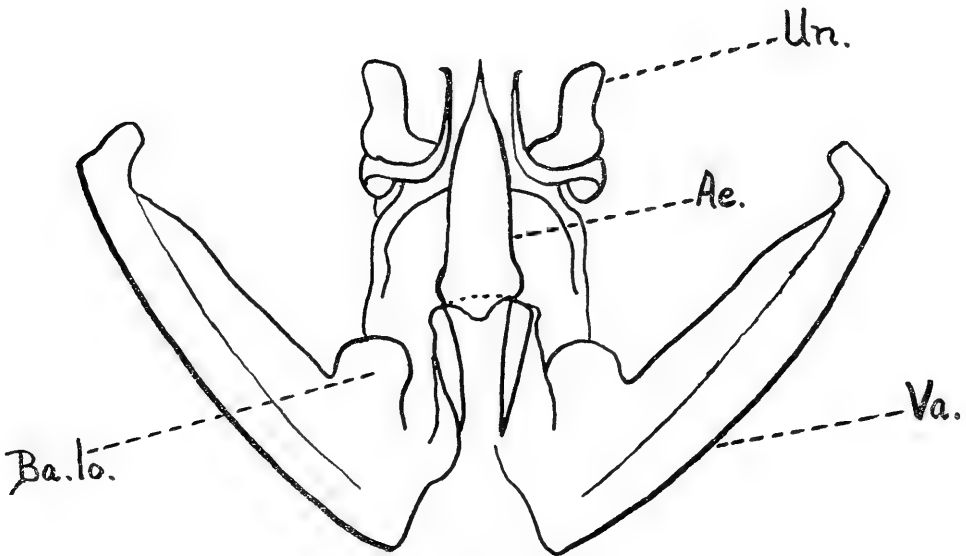


Fig. 1. Male genitalia of *Tarcus bowkeri bowkeri* from the type-locality

Allotype.: As in the male, upperside blue is also more extensive, saturated and less violaceous-tinged than in nominate subspecies. Less discal white marking on *Fw.* than in *T. b. bowkeri* but none at all on *Hw.* in *transvaalensis*.

UpFw.: Ground colour bluish, whereas in *T. b. bowkeri* the ground colour is white. White quadrate markings limited to areas bounding the dusky discal band of contiguous spots. Although there are whitish streaks on the costa the main areas of white are reduced to about 4 spots, 3 on the distal side of the discal band in areas 4-6, and 2 on the proximal sides of the 5th and 6th discal spots. Except for the white spot on the proximal side of the 5th discal spot, the rest of the white markings are small and indistinct. In some paratypes these are larger and clearer but there is considerable varia-

tion. There is a broad hind-marginal dark border on which an indistinct row of spots is made more noticeable by being bounded proximally with blue lunular markings. A large dusky or blackish spot closes the cell. Cilia as in male.

UpHw.: Same as in *T. b. bowkeri* except that there are no white markings other than the cilia and the blue covers all the wing surface except beyond area 5 which is dusky, also the inner marginal area which is mostly hoary-grey. The difference mentioned in blue shading also, of course, applies here.

Underside: The differences separating the males of the two subspecies of *T. bowkeri* as listed in this description also apply to the females with respect to underside colouration.

Paratypes: In males there is little to no variation while that in the females is limited mainly to the extent and size of the white markings.

Habits and distribution: According to Mr Ken Pennington (*in litt.*) there would appear to be no substantial differences in habits or choice of habitat between nominate *bowkeri* and *transvaalensis*. Further, Pennington states that this northern subspecies occurs on the tops of rocky hills and mountains along the Drakensberg escarpment from about Graskop and Pilgrim's Rest up to Mariepskop in the eastern Transvaal. Being local, its distribution would, no doubt, be largely disjunct. Its further reappearance on the Blaauwberg mountain in the northern Transvaal has already been discussed.

Remarks: This is a well-marked subspecies and the differences in the available material are quite constant. On dissection, of a limited number of specimens (1 *transvaalensis* and 3 *bowkeri*), there were no readily observable differences in the male genitalia. This finding was confirmed by Mr C. G. C. Dickson.

Material of *T. bowkeri bowkeri* available for comparison emanated from Port St Johns, the type-locality, Garden Castle, Game Pass and Balcomb's Hill, all except the first mentioned being situated in Natal. Altogether there were 14 males and 12 females; thus the total number of specimens of *T. bowkeri* available for study amounted to 21 males and 16 females.

One remarkable feature of the males of *bowkeri* from the type-locality, Inchanga, is the apparent constant possession on *UpHw.* of a transverse arc of 4 mid-discal, dusky spots in areas 2 to 5. No other known population of this species shares this character and it would have been tempting to regard this as another subspecies were it not for evidence of some instability in upperside discal spotting. For example the type-specimen(s) described by Trimen apparently lack(s) these 4 discal *Hw.* spots as his 1887 description makes no

mention of this feature. It is hardly likely that an astute observer like Trimen could have missed such an obvious character. Then too at least one Port St. Johns male shows incipient upperside discal spotting, even on the *Fw*.

The possibility exists that the original specimens described by Trimen were not taken at precisely the same spot from which subsequent collectors have obtained their material when attempting to collect at the type-locality. Should this be true it would make the population containing males with *UpHw*. spots even more unusual and restricted in range.

Finally, as a further argument against this form being recognised as a subspecies it must be pointed out that the variation it displays does not accord with the general pattern of geographical variation as outlined in this paper. For the present then, this population, inhabiting the flat-topped mountain overlooking the Inchanga Valley, must be dismissed as a local aberrant form or mutant, no doubt maintaining its genetic integrity through isolation from normal populations.

Note

During the course of this study the question of the affinity of *T. bowkeri* to its nearest ally, *T. thespis* (Linnaeus) had, as a matter of routine, to be considered. Examination of facies and the male genitalia led to the conclusion that the two species are more closely related than is perhaps realised and if it was not for the fact that there are no differences in the genitalia, between the two obvious subspecies *bowkeri* and *transvaalensis*, I would have regarded *T. thespis* as only sub-specifically distinct from *T. bowkeri*, as the genital differences are not at all striking. Thus it appears that the genitalia are very stable and that the differences between these two species although small, are of sufficient magnitude in this case to warrant their recognition as different species. As a matter of interest, and seeing the genitalia of *bowkeri* have apparently not as yet been examined and compared with those of *thespis* (apart from a brief diagnosis by Murray (1944)), I give the following account (see also illustration):—

1. The most obvious difference lies in the uncus which in *bowkeri* is consistently broader than in *thespis*.
2. The *aedeagus* is differently tapered in that the thin apical section is longer in *thespis* due to a narrowing further from the apex than in *bowkeri*.
3. There are differences in the structural formation about the basal parts of the valve. The most easily seen difference in *bowkeri* is a large conspicuous lobe in these parts which in *thespis* is much smaller and more weakly developed. This could be homologous with the *tectorius* or *virgae excitatae* (*vide* Stempffer, 1967) but this is open to question.

Abbreviations

UpFw. and *UpHw.* = uppersides of fore- and hind-wings. *Hw.* = hind-wing. *Fw.* = fore-wing.

Acknowledgments

My grateful thanks go to the following people who were kind enough to forward specimens on loan: — Messrs K. M. Pennington, C. G. C. Dickson, C. W. Wykeham, W. Henning, and J. C. McMaster.

I must also thank Mr C. G. C. Dickson of Cape Town for his generosity in allowing me to do the present revision as we had both independently come to the conclusion that two taxa existed among the extant material of *T. bowkeri*. Mr Dickson must also be thanked for reading and criticising the MS.

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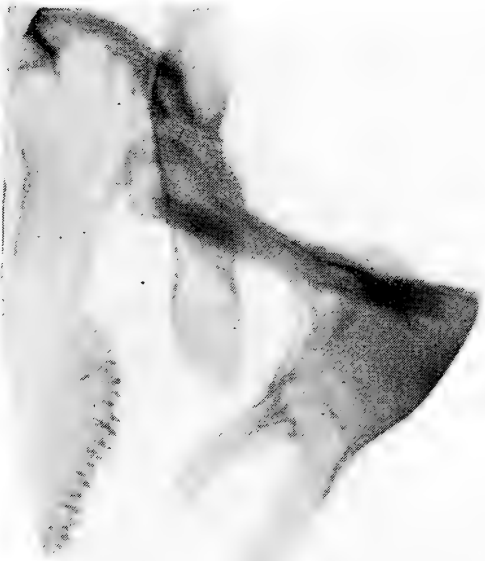
Designation of a Lectotype for *Erebia youngi* Holland

BY CYRIL F. DOS PASSOS¹ LL.B., D.Sc., F. R. E. S.

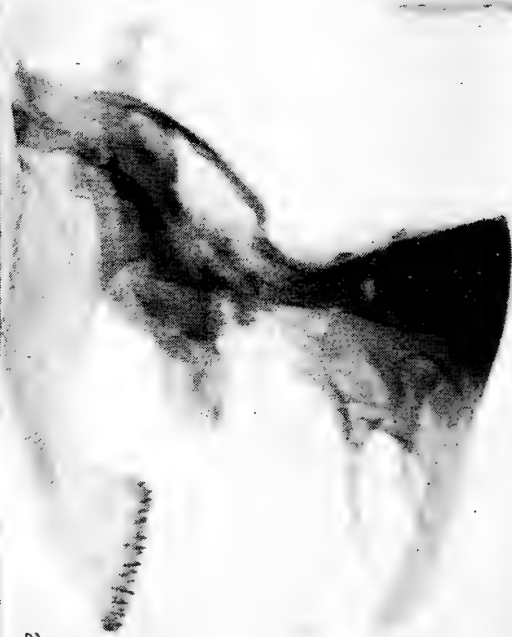
My friend, Mr B. C. S. Warren, in a recent paper (1969, 31:201) published in this journal, has suggested the designation of a lectotype for *Erebia youngi* Holland, 1900, and shown the necessity therefor. This is due to the fact that since the description of that species, another very similar Asiatic species, *E. dabanensis* Erschoff, 1871, has been discovered in Alaska, and there is the possibility that a third species, *E. kozhantshikovi* Sheljuzhko, 1925, may occur there also. However, the latter species is more easily distinguished from the other two on superficial characters. The first two, *dabanensis* and *youngi*, are difficult to separate by such means. Usually the genitalia must be resorted to. They also fly together at about the same time and are doubtless misidentified in many collections. It is important, therefore, to determine whether these species have been confused in Holland's type-series of *youngi*, since he never dissected any of his types. However, he was not unaware of this problem.

Holland proposed the name *Erebia youngi* in a paper (11:388) on Alaskan insects saying, "This species is not far

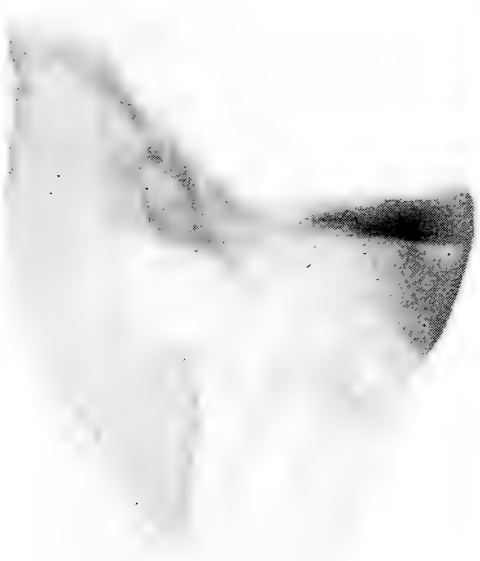
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2



3



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from *E. dabanensis* Erschoff . . . ” His type-series consisted of “3 ♂♂, 1 ♀ [actually 2 ♂♂, 2 ♀♀] [from the] mountains between Forty-Mile and Mission Creeks, N.E. Alaska, July 20th [Young].” It is not known whether all syntypes were taken in exactly the same place or along a rather long road.

Before the publication of the second edition of Holland’s *Butterfly Book* (1931), he must have discovered his error in the sex of the type-series because he figured (pl. 61) two female syntypes. Since that time the present author has seen all four syntypes and has dissected the two males. The first male syntype dissected (slide no. 246, 12.V.46) proved to be a specimen of *E. dabanensis*, but the second (slide no. 520, 20.VII.99) turned out to be *E. youngi* as that name has been used since it was proposed. These two dissections are figured (figs. 1 and 2).

A word must be written also concerning Holland’s use of the word “type” lest it be thought that he has already designated a holotype or lectotype in his references to “type” and “allotype” both in the text and on the plate of the *Butterfly Book*. This problem was examined by L. P. Grey and the present author in our *Systematic Catalogue of Speyeria* (1947, p. 2), and it was concluded that such use by Holland of the word “type” was of no effect whatsoever. The present International Code of Zoological Nomenclature (1964) does not change that conclusion, so the ground is now prepared for the designation of a lectotype of *Erebia youngi*. This second male syntype is hereby designated the lectotype of *Erebia youngi*. It is in the collection of Carnegie Museum and will be so labelled.

This second male syntype of *youngi* is figured by Holland (1931, pl. 61, fig. 28). It bears the following labels: “*E. youngi* ♂ Type/Mts. near Mission Creek/Alaska/July 20, 99, Young”, “*Butterfly Book*/pl. 61, fig. 28”, “♂ genitalia/slide 520/made 30.I.72 C. F. dos Passos” to which another label will be added reading “*Erebia youngi* Holland, 1931, Lectotype ♂ Ent. Rec. 1972, p. ?? C. F. dos Passos”.

The dissection of the second male syntype of *youngi* (slide 520, fig. 2) agrees well with Warren’s figure (1936, pl. 42, fig. 385) of a male in his collection *ex* Canadian National Collection taken at Nansen Creek, Placer Mineral Camp, Yukon (Caines), a locality in the same general region as the type locality of that insect.

Explanation of Plate XIV

Erebia youngi Holland Male genitalia × about 23

Fig. 1. *Erebia youngi* syntype No. 1, slide No. 246 = *E. dabanensis*, Carnegie Museum

Fig. 2. *E. youngi* syntype No. 2, slide No. 520, lectotype, Carnegie Museum

Fig. 3. *E. youngi rileyi*, slide No. 238, holotype, = *E. dabanensis*. The American Museum of Natural History

Fig. 4. *E. youngi herscheli*, slide No. 257, holotype, The American Museum of Natural History

(All slide numbers are preparations of the author)

Holland had actually labelled one of his male syntypes a "female" at or about the time that he wrote the original description, and that error, although corrected unannounced in the Butterfly Book (1931), remained unknown to the time that that insect was dissected. A label is now attached to that specimen stating that it is a male.

Distribution of *E. y. youngi*. Alaska, Arctic Circle, August, slide 256; Slana area 5200', 28.VII.65, slide 462; Mt. McKinley Nat. Park, 5.VII.58, slide 465 (paratype *E. y. rileyi*); Mt. McKinley Nat. Park, 19.VI.12, 20.VI.32, 28.VI.32, slides 469, 471, and 475; Death Valley, Seward Peninsula, nr. Nome, 10-30.VI.68, slide 493; and the lectotype herein before referred to.

Erebia youngi rileyi dos Passos (1947, p. 3) was named from a series of 16 males and 16 females taken on various dates at Mt. McKinley National Park, Alaska. The holotype was taken June 19th, 1932, and is in The American Museum of Natural History. It has been dissected and proved to be a *dabanensis* (slide 238), so this name falls as a synonym. All paratypes have not been dissected, but from those thus far examined, it is evident that the series is mixed. The name may be used, however, for a subspecies of *dabanensis* inhabiting Alaska if that population proves sufficiently distinct from the one existing in Asia. Nothing further can be said on that subject at present for lack of sufficient material, especially from the type locality of *dabanensis*.

Erebia herscheli Leussler (1935, p. 51) was named from three males taken on June 20th, 1930, on Herschel Island in the Beauford Sea, lat. 70°N., long 139°W., only a few miles from the international boundary between Alaska and the Yukon. Leussler suggested that it might prove to be a local race of *youngi* which is now confirmed by the genitalia of the holotype (slide 257, 20.VII.30, Herschel Island, Yukon, fig. 4), which is in The American Museum of Natural History.

Distribution of *E. y. herscheli*. Aklavik, N.W.T., 11.VII.31 (O. Bryant), slide 253; Cape Thompson, Alaska, 23.VII.64, slide 468; and Herschel Island, Yukon, 20.VII.30, slide 243 have been referred to this population.

So far as presently known, the distribution of *dabanensis* and *youngi* in Alaska and the Yukon are quite similar. Distribution of *dabanensis*. Mt. McKinley National Park, Alaska, 3000', 19.VI.32, slide 457; 17.VII.32, slide 476; 15.VI.32, slide 470; 20.VI.32, slide 472; 1.VII.37, slide 466. Headwaters Wheel Cr., Seward Pen., 22.VI.69 (leg. D. G. Roseneau), slide 495; mi. 18 Teller Road, Seward Pen., 13.VI.70 (leg. D. G. Roseneau) slide 494; ridge east of Harris Dome, dry rocky area, 2.VII.71 (leg. K. W. Philip), slide 518; Okpilak Lake, 7 mi. NE Mt. Michaelson, 28.VI.58 (leg. W. Malcolm), slide 477; Mt. Fitton, Yukon, 4.VII.70, slides 505, 506; Seward Pen., 4.VII.71, slide 517; mountains between Forty-Mile and Mission Creek, Yukon, 12.V.46, slide 246 (*E. youngi* syntype no. 1); Mt. McKinley Nat. Park, 19.VI.32, slide 238 (holotype of *E. y. rileyi*); Mt. McKinley

Nat. Park, 9.VII.32, 14.VI.32, 17.VII.32, and 19.VI.32, slides 247, 458, 473, and 474; Aklavik, N.W.T., 22.VII.31 (O. Bryant), slide 239.

Thanks are expressed to my friend, Mr B. C. S. Warren, for his generous assistance in solving the above problem and for reading a draft of this paper, which met with his approval; also to my colleague, Mr Harry K. Clench, Assistant Curator, Division of Insects and Spiders, Carnegie Museum, for his co-operation in the loan of the syntypes of *youngi*. Without his generous aid, it would have been difficult, if not impossible, to write this paper.

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ANOTHER REMARKABLE ABERRATION TAKEN IN THE NEW FOREST—On the morning of the 3rd September 1972, I found a male of *Calothysanis amata* L. ab. *nigra* Rebel in my m.v. light trap. It agrees with that described by Barrett (see South, 1961 edition, Vol. 2, p. 90) except that the cross lines are just barely discernable, and the amount of pink at the tips of the fringes is very slight indeed. These differences, however, may be due to the fact that my specimen is a little worn.—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 5.ix.1972.

Collecting in Jamaica: September and October 1971

By C. G. M. DE WORMS and T. J. G. HOMER

(continued from p. 223)

Part II by THEODORE HOMER who continues the story:—

At the termination of my stay at Williamsfield House and having decided to remain in Jamaica to await the next sailing of the 'Camito', I obtained accommodation at the 'Bonnie View', a hotel situated in a magnificent position on a 500' hill overlooking Port Antonio in one direction and looking up at the distant blue Mountains in the other. I had been well cared for there on two previous occasions and in 1965 on the one night's stay in February, lepidoptera including five species of Sphingidae readily came to the verandah strip lights. This isolated attractant is alas less potent than formerly owing to the erection since of a line of high powered street lights the whole way up the very steep hill from the town. I would add that visiting these lights which are very high somehow seems to draw simultaneously every vocal dog in the neighbourhood!

This second portion of my stay commenced with about three days of very heavy rain which might have been influential in encouraging out both butterflies and moths in the aftermath but clear moonlight nights and much dew kept moths to a minimum. Arrangements were made for a taxi to take me the four miles to Dragon Plaza M.V.s on suitable evenings. There is little further to report on activity there which was thin but on two separate evenings I recorded one hawk moth only but happily each was a new species for us and in mint condition. They were *Erinnyis obscura* F. and *Cocytius antaeus* Drury, the Giant Sphinx, the latter, a female with a wing span of $6\frac{3}{4}$ ". Fortunately I had handy a fine large sweet jar found for me by the hotel proprietress and this aided in gathering and killing in good condition. On one journey a number of previously recorded species were present but obviously battered by an earlier downpour and on another trip nothing, but a nice male *Manduca sexta* L. on a lamp standard at the bottom of my hill was a welcome addition. The commonest species was *Manduca brontes* Drury in a smaller and browner better defined form which indicates the apparent earlier emergence of a paler female three of which we took about a fortnight earlier which we mistook for *Manduca florestan*. Two more *Eumorphia satellitia* L. were recorded one of which in good order turned up at the hotel light in the storm, and another *Amphypterus gannascus* with its attractive pink underwings. The giant Noctuid *Ascalapha odorata* L. was also frequently recorded, some with distinctly blue sheen.

The commonest butterfly at and around the hotel was the Satyrid *Callisto zangis* Fab. and though several *Papilio andraemon* Hübn and *Papilio pelaus* F. were netted, the latter

not having appeared around Drapers, they were all in shocking condition and it was fortunate that *andraemon* were fresh around Williamsfield House earlier. As the days went by *Papilio polydamas* R & J began to make its appearance and I was able to secure two in good order prior to my departure. I took also in a nearby private garden the beautiful lycaenid *Heterosmaitia bourkei* Kaye. Dr Goodall reported also the presence of *polydamas* on Navy Island and together we watched them flying around there while we took refreshment at a party and following an abortive visit the previous afternoon. That day whilst waiting on the mainland for the ferry we observed several *Danaus plexippus* Linn. and it was easy to find the ova and indeed some young larvae.

Earlier, on Sunday 26th September, I visited Dr and Mrs Goodall at their home. He had kindly kept for me a specimen of *Historis acheronta* Fab. which had so far eluded us but had entered his trap the previous day. Also whilst there and shortly after the timely arrival of Dr Tom Turner from Kingston I netted a *Historis orion* Fab. as it settled on the outside of the trap netting. At that time there was a large number of *Phoebis sennae* Linn about the garden as indeed elsewhere and it is probable that a migration was in progress and comment was made during the following week of the many yellow butterflies flying around the fishing craft at sea, it being the occasion of over fifty boats competing in the Annual Port Antonio Marlin Tournament during the Southerly migration of these and other fish through the Windward Passage. Amongst the *sennae* I was glad to take a specimen of *Phoebis argente* Rob.

Dr Turner then conducted us over a lesser road into the East foothills of the John Crow Mountains. All was quiet, the weather delightful and the scenery glorious and though we were unable to find a track to the summit we had some sport taking specimens of *Phoebis statira* Cram. and later we were shown a colony of young larvae of *Colobura dirce* Linn. at work on the large leaf of its foodplant. A few days later he took me for a day's drive into the hinterland of Hope Bay and despite the wet and overcast conditions one cannot fail to be impressed with the grandeur and vastness of the Blue Mountain scenery and from viewpoints seldom seen by tourists. There was little on the wing and in the neighbourhood of Fruitful Vale quite late in the afternoon I noticed a swarm of about thirty *Heliconius charitonius* Linn. flying around a bush at the roadside. My familiarity with this striking insect dressed in its yellow and black striped 'warning' livery and its tendency to be both local and colonial did little to diminish my surprise on this occasion.

The morning I was due to leave for the ship, one of the hotel staff drew my attention to a *P. pelaus* with which he knew I had been having misfortune and bravely suggested I mount the roof of the lounge. I dared. There must have been some rich smelling attractant around as I beheld the sight of

the butterfly in question, a fine *H. orion* and a male *Hypolimnas misippus* Linn. flying together. Although I necessarily frightened away the latter I caught the *pelaus* and it was freshly emerged. The 'Camito' was delayed until the following afternoon and in the morning I wandered across the rough land near the ship watching a number of *D. Plexippus*. I casually swept at one that looked rather undersized and anaemic and found I had caught a nice *Danaus gilippus berenice* Cram. and strangely not seen for nearly four weeks. Despite a search I was unable to locate another. It is interesting to record that I have now taken this species in Sao Paulo, Brazil, Trinidad and now Jamaica and all three races are quite different.

Prior to sailing, receipt of a large box containing a good live specimen in cabinet condition of *Ascalapha odorata* sent down by Mrs Arnett, proprietress of the 'Bonnie View' and a personal farewell on board by Dr and Mrs Charles Goodall all of whom were so kind to me during my stay were gestures cherished and appreciated.

T. J. G. HOMER, M.A., M.C.I.T., F.R.E.S.

JAMAICA 1971 LIST

We have considered it of interest to give a full list of our joint captures among the butterflies and moths which were mainly of the macro-lepidoptera. All the moths, however, were recorded at Williamsfield House (designated as W.H.) or within its immediate vicinity.

BUTTERFLIES:—

PAPILIONIDAE

Papilio thoas Linn. Only seen in the region of Rosselle Falls.

Papilio pelaus Fab. Observed near Bonnie View Hotel.

Papilio andraemon Hübn. Numerous around W. H. and several seen in the streets of Port Antonio.

Papilio polydamus R. & J. At W.H. and on Navy Island off Port Antonio.

PIERIDAE

Phoebis sennae Linn. Very prevalent in all areas visited.

Phoebis statira Cram. Only seen in the Wild Crow Range.

Phoebis argante Rob. One taken in Port Antonio.

Kricogonia lyside Godart. One or two in the grounds of W.H.

Ascia monuste eubotea Godart. Only a few noted near W.H.

Eurema lisa Boisd. The commonest of this genus and seen everywhere.

Eurema nise Cram. Less prevalent than the last species.

Eurema dina Poey. Seen only in Blue Mountain region.

Eurema elathea Cramer. Also seen at Rosselle Falls.

Eurema दौरa palmyra Poey. Noted only at Rosselle Falls.

Eurema nicippe Cram. This fine species taken only at Rosselle Falls.

Eurema proterpia Fab. Worn specimens taken in the Blue Mountains.

Nathalis iole Boisd. This small insect also taken in the Blue Mountains.

SATYRIDAE

Calisto zangis Fab. This endemic and only member of this large Family seen in most afforested areas.

DANAIDAE

Danaus plexippus Linn. Seen in vicinity of Port Antonio.

Danaus gilippus berenice Cram. One taken at W.H. and another near Port Antonio.

HELICONIDAE

Heliconius charitonius Linn. A few at W.H. More on San San estate and at Rosselle Falls.

Agraulis vanillae Linn. Abundant round W.H., also near Mt. Pleasant and at Rosselle Falls.

Colaenis julia Fab. Numerous round W.H. and at Rosselle Falls.

ITHOMIIDAE

Greta diaphane Drury. Distinctly seen on the wing at Hardwar Gap.

NYMPHALIDAE

Anaea portia Fab. A few in trap at W.H. and many seen at Rosselle Falls.

Historis acheronta Fab. At least one in the trap at W.H.

Historis odius orion Fab. One in trap at W.H. and another at Bonnie View.

Euptoieta hegesia Staud. Fairly numerous near W.H. and near Mt. Pleasant.

Hypolimnas mysippus Linn. One seen at Bonnie View.

Anartia jatropha Linn. Very plentiful almost everywhere we collected.

Precis lavinia Linn. Abundant round W.H. but not many seen elsewhere.

Mestra dorcas Fab. This endemic species quite plentiful at and near W.H. and at Rosselle Falls.

Metamorphia stelenes Linn. Sparsely distributed at and near W.H. also on Sansan Estate.

Dynamine egea Fab. A few round W.H. at Mt. Pleasant and Rosselle Falls.

Phyciodes frisia Poey f. *gyges* Hewitson. One taken at Port Antonio.

LYCAENIDAE

Thecla columella cybara Hewitson. A few seen in Blue Mountain region.

Leptotes cassius Cram. Fairly common at W.H. and in most other areas.

Hemiargus hanno Stoll. Only seen at Moortown.

Heterosmaitia bourkei Kaye. One taken near Bonnie View Hotel.

HESPERIDAE

Urbanus proteus Linn. Numerous at W.H. and at Roselle Falls.

Cymaenes tripunctatus H.-S. A few seen round W.H.

Hylephila phylaeus Drury. One or two near W.H.

Gesta gesta H.-S. A few observed near W.H.

Pyrgus oileus Linn. Common almost everywhere.

MOTHS:—

SPHINGIDAE

Cocytius antaeus Drury. Two recorded.

Cocytius dunponchel Poey. One taken at lights.

Neococytius cruentius Cramer. Several noted.

Manduca sexta Linn. Several at the lights.

Manduca albiplaga Walker. Only two seen.

Manduca brontes Drury. A number at the lights.

Protambulix strigilis Linn. About half a dozen recorded.

Amplypterus gannascus Cram f. *jamaicensis*. Only three noted.

Pseudophinx tetrio Linn. Larvae seen in Sansan Forest area.

Erinnyis alope Drury. Only one noted.

Erinnyis ello Linn. Two specimens seen.

Erinnyis oenotrus Cram. A few at W.H. and supermarket lights.

Erinnyis obscura Fab. Only seen at Bonnie View.

Phryxus caicus Cram. A few noted.

Pachylioides resumens Wkr. Two seen.

Enyo lugubris Linn. Several seen at W.H. and Supermarket.

Eumorphia satellitia Linn. Two or three recorded.

Xylophanes pluto Fab. Fairly numerous at light.

Xylophanes tersa Linn. Probably the commonest Sphingid.

SYNTOMIDAE

Empyreuma anassa Forbes. This large dark insect only seen sparingly.

Cosmosoma achemon Fab. Only one taken of this semi-transparent species.

ARCTIIDAE

Lymire melanocephala Wlkr. A few at light.

Idalus delicata Möschler. A few at the supermarket.

Ammalo insulata Wlkr. Fairly numerous at W.H. and super-lights.

Utetheisa bella Linn. A few seen by day near W.H.

Ecpantheria nigroplaga Wlkr. A few seen at light in W.H.

DREPANIDAE

Drepanodes asina Druce. One or two at W.H.

SARROTHRIPINAE

Cassandra filifera Wlkr. Two or three at Supermarket.

NOCTUIDAE

Lyncestis acontioides Guen. A few at the usual lights.

Ascalapha odorata Linn. This huge black insect numerous in bait trap and a few at the lights.

Teinoletis simoenta Guen. Another very large noctuid fairly common at supermarket lights.

Aglaonice otognatha Hamps. Only one or two recorded.

Callopietria floridensis Guen. Occasional at W.H.

Callopietria jamaicensis Möschler. One or two noted.

Hemeroplanis scopulipes Haworth. A scarce visitor to light.

Amynta octo Guen. Fairly common.

Gerespa perpendicularis Guen. A few at light.

Cydosis nobilitella Cram. This curious small noctuid of Lithosiid appearance, quite numerous at the lights.

Bomolocha androna Druce. The only Snout species recorded.

Panula inconstans Guen. The commonest noctuid.

Prodenia ornithogalli Guen. A few seen.

GEOMETRIDAE

Sericoptera flavifimbria Wlkr. One at W.H.

Erastria decrepitaria Hübn.

Sylectra ericata Cram.

Sphacelalodes vulneraria Cram.

Thyrintina unicornis Rindge.

Irodopsis vicaria Wlkr.

Oxydia olivacea Wlkr. A few at W.H.

Semiothisa acidaliata Wlkr.

In addition there was the remarkable Hypsid already referred to, but as yet unnamed, of which a few have been taken in the Island in recent years. Also an undescribed species of Syntomid as well as an unknown member of the Noctuids. A tiny white Megalopygid proved to be new to science, while among the many Pyrales taken it is possible that few species may also be undescribed. Very few microlepidoptera were observed.

The nomenclature used for the butterflies is largely that used in the forthcoming publication "Jamaica and its Butterflies" by Dr Martin Brown and Mr Bernard Heineman. In it they enumerate 133 species of the Rhopalocera for the Island.

Finally we would like to accord our warmest thanks to all who most kindly helped in the identification of our captures. These included Dr Charles Goodall and Dr Tom Turner in Jamaica and in this country from the Natural History Museum at South Kensington the following:—Dr J. D. Bradley, Mr D. S. Fletcher, Miss M. A. Grogan, Mr Alan Hayes, Mr T. G. Howarth, Mr N. D. Riley, Mr M. Shafer, Mrs Kathleen Smiles and Mr W. H. Tams.

Three Oaks, Woking, and St Timothée, Maidenhead, 1.iii.72.

We apologise for the lateness of the September issue due to circumstances beyond our control and of this issue owing to a postal failure. —Ed.

Notes and Observations

ABERRATION OF OURAPTERYX SAMBUCARIA L. (LEP.) IN THE NEW FOREST. — On the morning of 24th July 1972 I found a remarkable specimen of this normally consistent species in my m.v. trap at Minstead. Unfortunately one of the "tails" was damaged, possibly by a Great Tit, which had got into the trap, but otherwise the specimen, a male, is in good condition.

The ground colour appears a greenish-tawny, but examination under the microscope shows it to be composed of orange-tawny, pale yellow and pale grey scales. In the forewings the colour darkens towards the outer edge. The hindwings are of the normal pale yellow at the base and streaked with the darker colour towards the outer edge. The costa is darker grey.

The cross lines of the forewings (grey in type specimens) are more orange, the first line bordered internally and the second line externally with a narrow yellow band. In the hindwing, the cross line appears chiefly in the yellow portion of the wing. The normal strigulations and discal mark do not appear except under the microscope, when it can be seen that they are formed by rows of light grey scales. The borders of the wings are pale yellow with the cilia orange tawny.

The head, body and orange and black marks on the tail are as in typical specimens.

Dr de Worms has kindly consulted the RCK Collection at the British Museum (Natural History) where there is a similar specimen referable to *ab.olivacea* Standfuss, but says my specimen is considerably more extreme with a deeper ground colour. — L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 28.vii.1972.

LATE LARVAE OF GONEPTERYX RHAMNI L.: As evidence of the lateness of the 1972 season, on 24th July in a well known wood south of Salisbury, when in company with Dr John Eagles of Corsham, I found a small bush of *Rhamnus frangula* harbouring a number of Brimstone larvae. Nearly all were quite small, and none more than half grown. Normally these larvae are full-fed quite a month earlier than this date and the imagines are often on the wing by early August. Now it does not look as if the summer brood of the Brimstone will be flying until the end of August or well on into September this year.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey, 27.vii.1972.

(On 22nd July 1972 at Hindleap Warren, Ashdown Forest, I noticed a female *G. rhamni* ovipositing on a small stand of *Rhamnus frangula* at about 1600 hours in bright sunshine.—Ed.).

PEDIASIA CONTAMINELLA (HÜBNER) IN MIDDLESEX—On the night of 27th July 1972 I operated an m.v. trap near the river Lea at Enfield Lock and was pleased to find in it four specimens of an unfamiliar Crambid which sat with its abdomen up like an *Argyresthia*. These were identified as *P. contaminella*. Two nights later a trap in the same position yielded more than ten specimens satisfying me that the species is resident there. Being now familiar with the species I have found that I took one last year at Winchmore Hill, N. 21 about five miles away, and on the night of 7th August I have taken one specimen in my garden here, about a mile from the river.

Beirne says of this species "It may be widely distributed in England on coastal sandhills and on light sandy soils inland." It was found fairly commonly at Buckingham Palace (Proc. S. Lond. ent. nat. Hist. Soc. 1963 p. 67). The Enfield Lock locality is on London clay, it is also a few yards from the Essex county boundary and only a mile from that with Hertfordshire and it can be assumed that it could be found inland in both those counties. — DAVID AGASSIZ, St James' Vicarage 144 Hertford Road, Enfield, Middx. 8.viii.1972.

SORHAGENIA JANISZEWSKAE REIDL IN ESSEX. — During the field meeting of the British Entomological and Natural History Society held on the 15th July 1972 at the Backwarden, Danbury Common (one of the reserves of the Essex Naturalists' Trust), I noticed that many of the terminal shoots of *Frangula alnus* Mill. were dead. The cause was a larval mine filled with frass with a small exit hole at the side. This was clearly the feeding of *S. janiszewskae*. As far as I am aware, this is the first record of that species north of the Thames, the previous reports having been from Kent, Sussex, Surrey and Hampshire.

It appears likely that Stainton's description of the larval feeding of "*Laverna rhamniella*" is in part descriptive of *janiszewskae* and in part of *S. lophyrella* Dougl. and/or *S. rhamniella* Zell. He writes: "The young larva mines down the stems of the young shoots of *Rhamnus catharticus* and *R. frangula*, thereby causing the terminal leaves to droop (just as the young larva of *Hyponomeuta plumbellus* by a similar habit, causes the young shoots of *Euonymus Europaeus* to drop); it is then very small, and soon quits the stem to feed on the young leaves, which it slightly rolls up and then eats from the interior." (*Natural History of the Tineina*, XI: 220, 1870). The larvae of *lophyrella* and *rhamniella* do not mine or cause the terminal shoots to droop while that of *janiszewskae* does not spin the young leaves, for it completes its growth in the stem of the shoot.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 1.viii.1972.

NEW LOCALITIES FOR *PLATYCHIRUS PODAGRATUS* (ZETT.). DIPTERA: SYRPHIDAE. — In his Royal Entomological Society "Handbook" Coe classifies this species as uncommon, and records its distribution as Scotland, Lancashire, Cheshire, Derby, Leicester and Gloucester. However, whilst on holiday in North Devon in 1971, I found specimens in two localities. It was present in quite large numbers in Clovelly on 15th August, and in smaller numbers on Exmoor on the following day.

On returning home, I was pleased to find that my collecting companion, Chris Searle, had found the same species in East Dorset on 7th August — ALAN J. BROWN, 12 Riverside Court, West Moors, Dorset. 20.vii.1972.

IMMIGRANT LEPIDOPTERA ON THE LINCOLNSHIRE COAST — On the morning of July 16th, on one of the few really hot, sunny days of the year and after a period of light south-westerly winds, a number of *Vanessa cardui* L. and *V. atalanta* L. were seen at the foot of the coastal sandhills. On the night of July 18th a male *Celerio galii* Rott. in perfect condition was taken in a light trap by my friend Geoffrey Wright some five miles from the coast and I am informed that a second, a female, was taken at about the same time at honeysuckle flowers near Scunthorpe. On the night of the 29th July, two specimens of *Plusia interrogationis* L., with a third on the 31st, appeared in my m.v. light trap here. They are very different in appearance from those occurring in the nearest locality that I know of, some fifty miles away, and from any that I have taken in other parts of Britain.—R. E. M. PILCHER, The Little Dower House, South Thoresby, Alford, Lincs. 13.viii.1972.

A GYNANDROMORPH *PIERRIS RAPAE* L. — Whilst holidaying in Devon this year, the family visited Dawlish Warren on the 2nd of August, more for pleasure than for collecting. However, as the day was very warm and sunny, I decided to see what was flying, so with my son Christopher and my daughter Sandra, we walked the length of the Warren. On the return journey, alongside the golf course, my daughter brought me a small white she had caught. This turned out to be a perfect halved gynandromorph, right side male. This is the reverse way round to the illustration by Frohawk on page 305 of his *Complete Book of British Butterflies*. — F. J. RENSHAW, 53 Links Road, West Wickham, Kent. 12.viii.1972.

EUROIS OCCULTA L. IN SOUTH WESTMORLAND. — The occurrence of *E. occulta* in this district appears to be dependant on immigration. There was a big influx of the species here in 1954 (*Ent Record* 66: 240) but few records since. On 2nd August 1972 I was very pleased to take a male of the species in my trap here at Kendal Wood on the outskirts of Kendal.

The specimen is of the usual pale form which I associate with specimens of continental origin.

It has been a poor year for lepidoptera and migrants in general have been noteworthy by their absence. In spite of regular trapping I have had only one *Plusia gamma* L. so far this year—on June 25th!—DR NEVILLE L. BIRKETT, Kendal Wood, New Hutton, nr. Kendal. 28.viii.1972.

THE FOOD PLANT OF *AGRODIAETUS COELESTINA* EVERSMAHN—In early June 1972 I visited the Peloponnese, Southern Greece in order to try to obtain a small number of *A. coelestina*, which was only recently discovered as a new Western European butterfly (*Ent. Record*, **84**: 29-32). The butterfly was found to be closely associated with a certain species of vetch, and eventually two females were observed ovipositing on the stems of the plant. The plant was subsequently taken to the Goulandris Botanical Museum, near Athens, and was identified as *Vicia dalmatica* Kerner.—JOHN G. COUTSIS, Athens, Greece. 26.viii.1972.

SIFOLINA LAURAE EMERY (HYM. FORMICIDAE) IN S. HANTS.—A new county record was made for this rare, workerless parasitic species in South Hampshire, at Avon Common near Hurn, on 25th August 1971. This record is interesting in that it is the second only for Great Britain. The first record was from near Wareham, Dorset, in 1965, and was made by Dr M. V. Brian of Furzebrook, who informed us that the nest has since been overrun by *Lasius niger* L., and that the Hampshire nest now represents the species in this country. Dr Yarrow informs us that there are now no inhabited sites known on the continent, but that present research by Kutter may show a synonymy with two other continental species.

Two females were taken from the nest which was also occupied by *Leptothorax acervorum* Fab., and *Myrmica scabrinodis* Nyl., the latter also being present as host species in the original nest. One of the specimens is now in the British Museum collection.

Thanks are due to Dr M. V. Brian who positively identified the specimens, and to Dr I. I. H. Yarrow of the British Museum (Natural History).—P. J. ATTEWELL and S. D. MACKEY. 3.ix.1972.

Current Literature

How to begin the study of Entomology by Anthony Wooton, 15p; British Naturalists' Association, 18p post paid.

The author of this little pamphlet has set out his subject in a way to appeal to intelligent would-be entomologists in the first place, and even to more advanced entomologists as a quick means of reference to other orders than those with which they are familiar. He achieves this by setting out with the idea that his readers are intelligent people. This is a pleasant deviation

from the "aint Nature wonderful" syrup ladelled out by so many to budding naturalists.

The pamphlet commences with practical advice under the headings: What are insects; insect structure; metamorphosis; insect senses, food of insects; insect classification; when and where to see insects and describing and recording.

This is followed up by a list of the Insect Orders, each accompanied by a short but succinct paragraph explaining its main characters. After this, there is a short bibliography subdivided under the various orders.

The cover is illustrated by a collection of insect photographs by G. E. Hyde, and the text also has a page of his photographs and also one by John Clegg. There is also a diagrammatic illustration of insect anatomy.

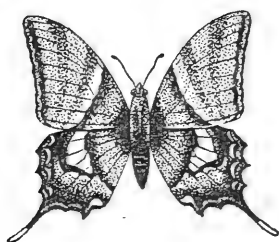
Finally he mentions the A.E.S. and the British Naturalists' Association as societies to join, and it is here that I offer my only adverse criticism which is of his omission of The British Entomological and Natural History Society which holds a regular series of both indoor and outdoor meetings, and whose membership includes all grades from beginner to professional who meet to the mutual benefit of all.—S.N.A.J.

Woodlice by Stephen Sutton M.A., D. Phil. 144pp+8 col. pl. Ginn & Co., Ltd., £2.00.

In his preface, the author gives as his reason for writing this book, the fact that woodlice are being used increasingly in the teaching of biology. Beside this, it is high time that this branch of the Arthropoda had individual attention and, for the first time, coloured illustrations. These are by **Hillary Burn**, who has biological training as well as her artistic abilities, and has combined these to produce truly excellent coloured figures; she has also provided the line drawings illustrating the text.

The text covers the subject from a wide angle, dealing systematically, chapter by chapter, with Body Structure, Physiology, Behaviour, Genetics, Food, Predators and parasites, Population ecology, Identification of British woodlice (which chapter starts with a check-list followed by a key to the families, and then a key to the genera in each family. These genera are then keyed individually for species, the keys being illustrated by excellent line drawings of the details used. The coloured plates illustrate nine species and there are distribution maps for four species), and finally there is a chapter headed Techniques of Study in which collecting and laboratory studies are discussed. An appendix mentions distribution study in Britain, and a bibliography gives more than fifty references. An index completes the book.

The book is well printed and is bound in plastic covered boards. The paper is of good quality. The book is of course an essential for the student of the Isopoda, but it is also a most desirable item for the biology library, and also for anyone having an interest in the living creatures which he may encounter during his daily round.—S.N.A.J.



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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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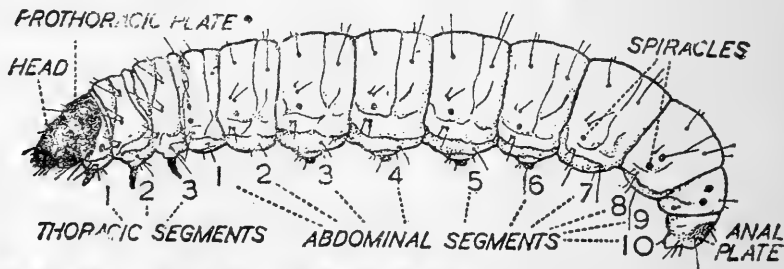
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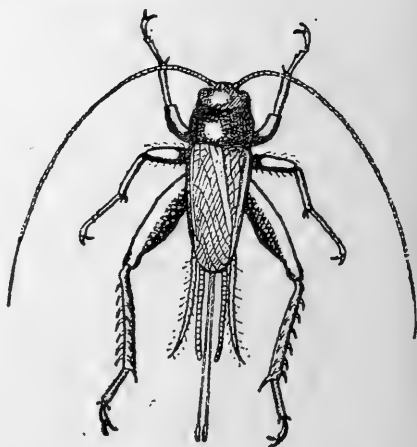
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Observations on and a description of a race of *Thestor basutus** (Wallengren) (Lepidoptera : Lycaenidae)

By C. G. C. DICKSON

No. 27

Specimens of this butterfly from various localities may show some quite noticeable variation beyond the usual individual variation which occurs — as for instance up-country ones in comparison with those from near the coast of Natal. Female examples from Zeerust in the Transvaal have the whitish markings of the upperside enlarged and very prominent, while the males themselves exhibit some features which distinguish them from males from the Natal coastal belt. Comparatively small differences which have been found in the male genitalia are not sufficiently marked to be of any specific significance. Though known to earlier observers, there does not appear to have been any critical, published reference, to this type of variation in *Thstor basutus*—apart from Trimen's remarks in *South African Butterflies*; II (1887) concerning some Potchefstroom females he had examined. For reasons that are given later, it is concluded that specimens from near the coast of Natal answer, at least closely, to nominate *Th. basutus*. Material from other inland localities besides Zeerust has also been studied. In the meantime, the representative of this butterfly from Zeerust seems sufficiently distinct to be regarded as a separate race—and a description of which is given hereunder.

Thestor basutus capeneri subsp. nov.

Male

The forewing is more pointed than in the male type of nominate *basutus*.

Upperside

All wings marked similarly to those of the type but the dark markings in general, especially in areas 2 and 3 at distal end of sex-patch, though certainly elsewhere also are more pronounced; while the light markings bounding outwardly the dark discal series in the forewing diminish in size or almost disappear towards the innermargin—whereas those in the male type remain relatively large and prominent. Cilia, in all wings, darkened less noticeably at ends of veins than in the type.

Underside

Apparently no constant difference apart from the dark discal series of spots of the forewing being decidedly better developed than in the male type; and the remaining spots, in

**Zeritis* ? *basuta* Wallengren, *Bih. K. svenska VetenskAkad. Handl.*, 1857, *Lep. Rhop. caffr.*, p. 46.

some cases, larger.

Length of forewing: 17·0-19·0 mm (the former measurement, that of holotype).

Female

Upperside.

The dark spotting in all wings, as a whole relatively reduced in size, with a corresponding expansion of the white or whitish areas, taken as an aggregate; and the dark discal series of the hindwing more outwardly placed than in the female type of nominate *basutus*.

Underside

Fairly close to that of female type, especially as regards forewing, in which some of the dark spots are, however, less elongated and extended distally. The hindwing much more irrorated with greyish-brown scaling, lacking the noticeably whitish background present in the female type; and the spots, in which the actual edges are less dark than in the type, not contrasting as clearly with this background.

Length of forewing: 21·25-22·0 mm (the former measurement, that of allotype).

Body and ancilliary parts, in both sexes, as in the types of *basutus*.

♂ Holotype, TRANSVAAL: Lucerne, near Zeerust, 15.XI.1948 (A. L. Capener); in author's collection.

♀ Allotype, TRANSVAAL: data as holotype, 16.XI.1948; in author's collection.

Paratypes in author's collection: data as holotype, 1 ♂, 1 ♀.

Paratype in Coll. Naturhistoriska Riks-Museum, Stockholm, as holotype 1 ♂.

Paratypes in Coll. Transvaal Museum, as holotype 16.XI. 1948, 1 ♂, 15.XI.1948, 1 ♀.

Paratype in Coll. National Museum, Salisbury, Rhodesia, as holotype, 16.XI.1948, 1 ♂.

The male holotype of *Arrugia basuta* Wallengren is very similar on the upperside to Natal males from the Botha's Hill-Drummond-Inchanga area in which the light postmedial markings of the forewing are clearly developed and which have the forewing of a less pointed shape. In these specimens the dark marking at the end of the sex-patch is, however, normally quite prominent. The underside also, although the forewing in particular is very light, resembles that of this taxon. There is, however, less irroration between the markings of the hindwing than usually occurs in the above Natal males. After some 130 years, general fading is naturally apparent in the type-specimen.

Length of forewing, in the male type: 17 mm. This specimen is in very good condition for its age, as is the female type.

Of the six labels on the above specimen, one is inscribed "Caffraria" and another "J. Wahlb" [=J. Wahlberg]. Dr

Persson has informed the writer that the area in which Wahlberg travelled lay between $30^{\circ} 25'$ and 23° South lat.; and 27° and $32^{\circ} 40'$ East long. These particulars show clearly that the designation "Caffraria" as applied to Wahlberg's travels can be misleading, since one usually visualises the large tract of country once known as Caffraria as not extending beyond the southern boundary of Natal.

Length of forewing, in the female type: 17 mm. The specimen is very small, for a female of *Th. basutus*. Although attention has been drawn to the resemblance of the types to Natal specimens procured by the writer in the area mentioned, the absence of any precise data precludes the original locality necessarily falling, with any certainty, into this general area of Natal.

Th. b. capeneri is by no means restricted to the Zeerust district but the limits of its distribution have not as yet been determined. Specimens of *basutus* from Cathcart in the Eastern Cape, taken by Mr J. C. McMaster, are distinctive in their own way, rather approaching *capeneri*, but a single female from there is very dark, on the upperside. A male captured by Mr C. D. Quickelberge at Port St. Johns, in Pondoland, is similar to Natal specimens. Amongst material from the Transvaal Museum provided for examination by Dr L. Vári, a Kalahari male and female taken by the late Dr G. van Son in March 1930, are unusually pale on both surfaces. Rhodesian specimens have been loaned by Dr E. Pinhey, of the National Museum, Bulawayo. Several of the females are extensively marked with white and, in one specimen in particular, from the Sanyati Valley, caught by the late Capt. R. H. R. Stephenson in Sept-Oct., 1925, the underside is very light.

Since males from the Botha's Hill area are likely to have similar genitalia to the male type of *basutus*, those of one of the former are figured together with the genitalia of *Th. b. capeneri*. While the genitalia of these and other specimens dissected have varied within limits, individually, at least two of the differences noticed have been repeated in the preparations, anyway, so far made, these including the more produced shape of the *juxta*, in *capeneri*, below the point of angulation — although the general configuration of the *juxta* is far from stable, in different specimens. Except in one specimen in which normal development had not occurred, the *saccus* has been much broader (and spatulate) when viewed from above, in *capeneri* than in Botha's Hill males.

The present race is named with pleasure after Mr A. L. Capener, the well known authority on the Membracidae, who collected and also reared many interesting butterflies in the Transvaal and Natal, in the forties. Most of this material was incorporated in a collection of Mr A. J. Duke's which was subsequently presented to the writer.

Sincere thanks are due to the following persons who generously provided specimens for examination:—Mr W. H.

Henning and his sons Graham and Steven; Mr Cameron McMaster; Dr Inge Persson; Dr Elliot Pinhey; Mr C. D. Quickelberge; and Dr L. Vári. Dr Persson most kindly sent the types of *Th. basutus* on loan to the writer from Sweden. He had previously been unaware that these were in his Museum, owing to their being under the generic name of *Arrugia*.

The male genitalia of *Thestor basutus* have been briefly referred to and figured by the late Rev. Desmond P. Murray in *J. ent. Soc. S. Afr.*, X (2), 1948; while the life-history has been described and illustrated in colour by Clark and Dickson in *idem* 23 (2), 1960, and in *Life Histories of the South African Lycaenid Butterflies*, 1971, Cape Town.

Thestor basutus inhabits open country with short vegetation amongst which grass is usually prominent. In Natal, it has frequently been found in elevated situations and sometimes on rather rocky ground. The males are quick in their movements, taking short, irregular flights and then settling on the ground, with closed wings, while the females normally have a more wandering flight. From observations made in Natal, eggs are deposited on small plants infested by Homoptera, on the immature stages of which the young larvae feed, up to and including the 3rd instar; but the final part of the larval life is spent in ants' nests in the ground, under stones or rocks, and in which pupation also takes place. "Blencathra," Cambridge Avenue, St. Michael's Estate, Cape Town.

EXPLANATION OF PLATES

PLATE XVI

- Fig. 1. *Thestor basutus* (Wallengren), ♂ type (upperside).
Fig. 2. *Idem* (underside).
Fig. 3. *Thestor basutus* (Wallengren), ♀ type (upperside).
Fig. 4. *Idem* (underside).
Fig. 5. ♂ Genitalia, *Thestor basutus* (from Natal), with dissected parts enumerated thus:—a. Basic portion of structure with some parts removed. b. Uncus. c. Falces. d. Labides. e. Valves. f. Aedeagus g, g. Juxta (two specimens represented). h. Saccus. Figures of imagines approximately 1.45 times natural size. Figures of genitalia approximately 19.5 times natural size.

PLATE XVII

Thestor basutus capeneri subsp. nov.

- Fig. 1. ♂ Holotype (upperside)
Fig. 2. ♂ Holotype (underside)
Fig. 3. ♀ Allotype (upperside)
Fig. 4. ♀ Allotype (underside)
Fig. 5. ♂ Genitalia, with dissected parts enumerated thus:—a. Basic portion of the structure with some parts removed. b. Uncus. c. Falces. d. Labides. e. Valves. f. Aedeagus. g, g. Juxta (two specimens represented). h. Saccus. Figures of imagines approximately 1.45 times natural size. Figures of genitalia approximately 19.5 times natural size.

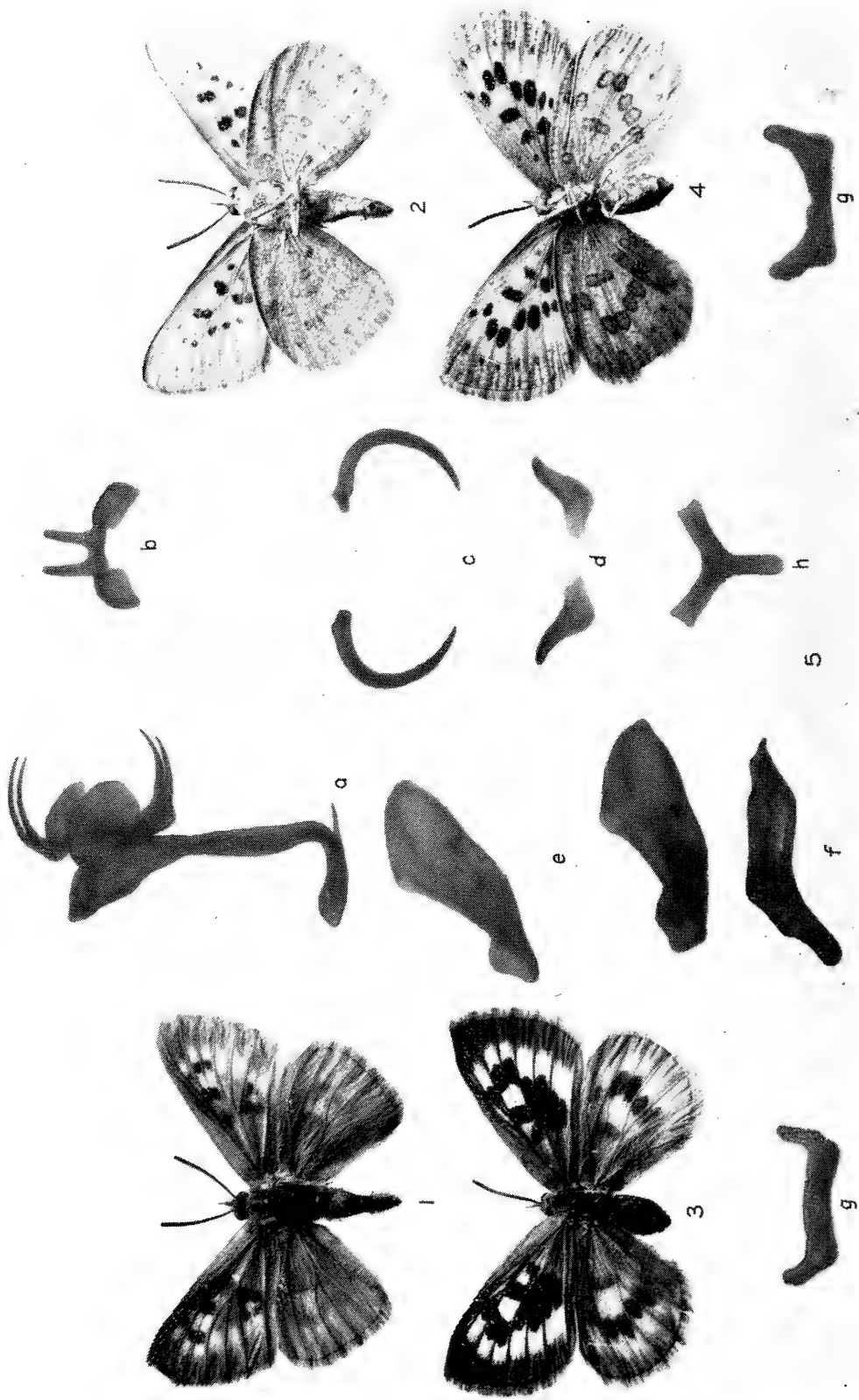
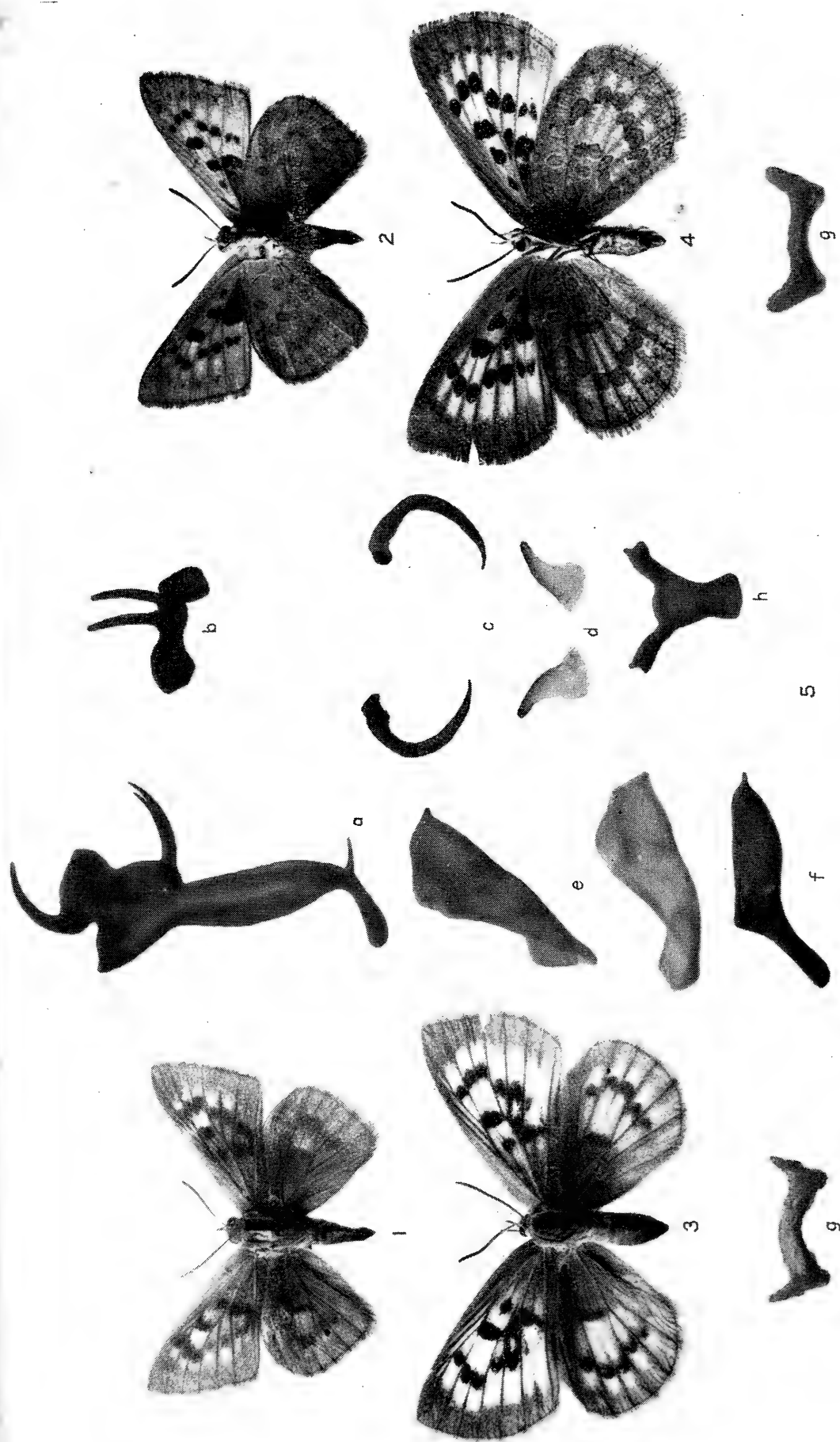


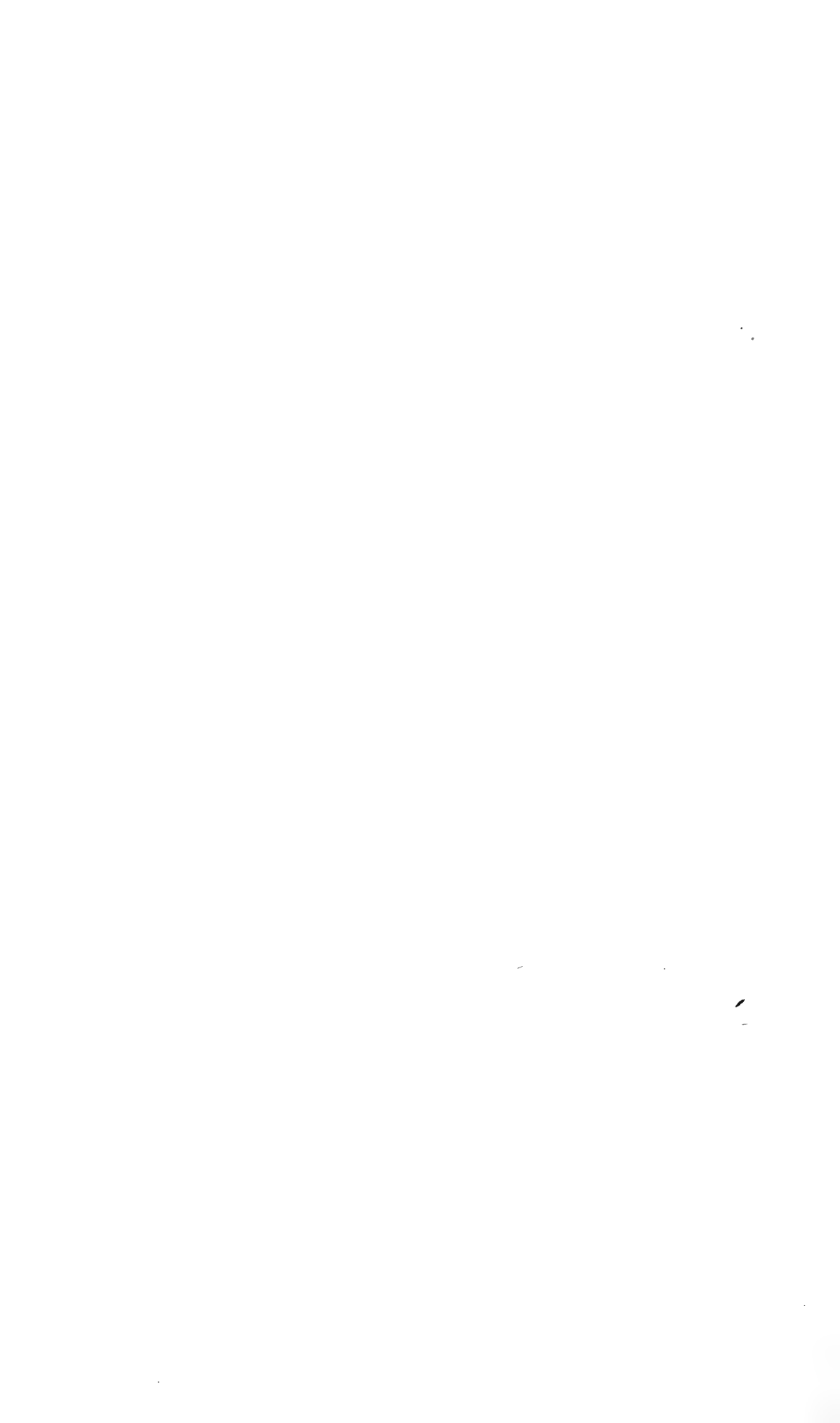
Photo: H. N. Wykeham.

Thestor basutus (Wallengren)

Photo: H. N. Wykeham.



Thestor basutus capeneri subsp. nov.



Butterflies in Northern and Central Greece, July 1971

By J. V. DACIE, M.D., MARGARET K. V. DACIE AND PHILIP
GRAMMATICOS, M.D.

NORTHERN AND CENTRAL GREECE



The following is a brief account of our observations and captures during a holiday in northern and central Greece between the 2nd and 20th July, 1971. It was our deliberate intention to visit areas, as far as we could, in which the butterfly fauna was not well known. In all 114 species were seen or collected including some, e.g., *A. ilia clytie*, *E. ligea*, *S. pruni*, *E. decoloratus*, *E. alceas*, *P. eroides* and *C. lavatherae*, not recorded in lists recently published by Coutsis (1969, 1972) and Bretherton (1970) or mentioned by Higgins and Riley in

A Field Guide to the Butterflies of Britain and Europe as occurring within the present geographical boundaries of Greece. We travelled by car and most of the collecting was by the wayside where the terrain seemed most favourable. As the accompanying map shows we travelled quite long distances.

We first collected en route from Athens to Thessaloniki and on the slopes of Mount Pilion near Volos. Then, based at Thessaloniki, in separate sorties, we collected near Florina, which is close to the Albanian and Jugoslavian borders, on Mount Olympos, on Mount Cholomon in the Chalcidiki peninsula, and Nr. Drama, Kavala and Xanthi in Eastern Macedonia. It might have been more profitable if we had spent several days in one locality, but the trip was undertaken by way of reconnaissance. We purposely covered as much territory as we could in the limited time available to us.

On the 2nd July, travelling north from Athens, we stopped briefly at the sulphur springs at Thermopylae, where freshly emerged *G. rhamni* and *G. cleopatra* were flying together, alongside several other species including *H. fatua*. It was here we netted the only specimen of *G. nostradamus* we saw. Further north, about 12 km. south of Volos, we collected in an olive grove leading down to the sea. Here *H. fatua* were abundant and we saw, too, several *T. balkanicus* and netted a single female *E. marloyi*. We stayed at Portaria perched 550 m. up the slopes of Mount Pilion overlooking the Pagasitikos Gulf. On the 3rd July we collected up the road running east out of Portaria up to a height of about 1200 m. where there is a ski run. About 40 species were identified including *P. anthelea amalthea* and *K. roxelana*, in one localized colony associated with *Q. quercus*, and *A. admetus* in several places. At the summit of the road there was a large colony of a "silver-studded" blue, identified as *P. idas graeca* Tutt.

The morning of the 4th July was spent collecting in a rocky ravine near Makrynitsa, a village about 4 km. north of Portaria. at about 700 m. About 30 species in all were noted, including *G. farinosa* and *P. pandora*. Makrynitsa was the only place where we found these species, and several more *P. anthelea amalthea* were seen. In the afternoon we travelled to Tsangarada on the east side of the Mount Pilion peninsula. Several *P. krueperi* were caught in one restricted locality and a single female *T. thersamon*. We stayed at the Xenia hotel at Tsangarada for the night of the 4th July and on the following day we travelled to Thessaloniki, collecting at several places en route including the Vale of Tembi, where we netted a rather worn *C. jasius*.

On the 6th July we journeyed to some hills about 10 km. north of the town near Laina. *C. briseus* was abundant in fine condition and there were also a few *H. fatua*. *M. trivia* were plentiful, too, and a few small *M. phoebe* were also caught. *L. thersites* were especially numerous and were settling on patches of damp mud in scores.

On the 7th July we travelled in cloudy and rainy weather to Florina where we obtained passes to enter the military zone in the mountains west of the town, and on the 8th we travelled up the road to the west to Pisoderi and to about 1 km. beyond, collecting at several places between 1,000 m. and 1,450 m. The mountainous countryside was green and the flowery meadows in some places were reminiscent of Switzerland. 47 species were noted, including *E. ligea*, abundant in one spot, *A. hyperantus*, a colony in a sheltered and watered locality where *M. arion*, a large dark and heavily marked form, was also flying, as well as a "short tailed" blue. This has been identified as *E. alcetas* (although showing a small single orange lunule medial to the marginal black spot in S2 on the hind-wing underside). A single *A. anteros* and three *P. eroides* were found in the same flowery track as the *E. ligea*.

On the 9th July we travelled north to the border village of Niki and then west into the hills close to the Yugoslavian border where we walked up a wooded and rather dry valley. The catch included a single rather worn female *A. ilia clytie*, *N. antiopa*, *S.w.-album*, several more *E. alcetas* and a single *C. lavatherae*. In the late afternoon we returned to near Pisoderi where *P. eroides* had been caught the previous day, but it had partly clouded over and no interesting blues were seen, although *E. ligea* was still flying. A solitary worn *P. sidae* was caught.

On the 10th July we travelled from Florina back to Thessaloniki and collected briefly at several places on the dry and rocky hills between Florina and Edessa just north of Lake Vegoritis. *L. duponcheli*, males of the second brood, were quite common in several places and several very fresh *C. australis* were caught. *H. lycaon*, *H. lupina* and *P. anthelea amalthea* were also taken. We also found a colony of *H. semele*, the only specimens we saw on the whole trip. *A. admetus* and *A. ripartii* were flying together and a single *S. pruni* was also caught.

On the 12th July we collected on Mount Cholomon in the Chalcidiki peninsular, walking down from the summit of the road, about 2 km. towards Thessaloniki. *M. galathea* and *M. jurtina* were the commonest butterflies and *M. arion* in a large and moderately heavily marked form was quite common over the whole area. That evening we travelled to Katerini where we stayed for two nights, using the town as a base for Mount Olympos.

On the 13 July we took the road to St Demetrios, a village north of the mountain at about 800 m. On our way up to the village we took *H. alcyone syriaca* and a single female *T. thersamon*. Passing through the village the road climbed to the top of a pass where *B. circe* were abundant. Then the road descends to the west of Mount Olympos through dry and rocky hills and here we found a large colony of *H. lycaon*. We finally turned east to climb up the rough military road wind-

ing up the west-facing and rather bare and open slopes of the mountain and eventually reached about 2100 m. There was, however, little sunshine and relatively few insects were flying. However, at about 1500 m. in a grassy and lightly wooded ravine we came across a colony of *A. hyperantus*. *M. galathea* were widespread and at high altitudes fine specimens with wide black borders were noted.

On the 14th July we collected on the east side of Mount Olympos travelling via Litochoron. At the monastery at the foot of the mountain we netted two *L. celtis* feeding on brambles amongst many fritillaries. We then drove up the rough road to the Mountaineering Club House at 1010m. and proceeded further up the road to approximately 1500m. collecting at likely spots en route. This part of the mountain is rather densely wooded but there were small clearings in which many species were flying. *L. celtis* was abundant and flew up and down the road, particularly above 1000m. In all about 43 species were caught or identified, including a single fresh male *H. ottomanus* caught at about 1400m. The large silver-studded blue *P. idas graeca* was quite plentiful at the highest levels we reached.

On the 15th July we returned to Thessaloniki from the Mount Olympos area making a diversion via Edessa to a locality just north of Lake Vegoritis where we had collected briefly on our return from Florina on the 10th July. This time we walked up a gently sloping narrow open valley with a dry river bed. Plenty of insects were flying including many *L. duponcheli* and *P. ergane*, also *T. balkanicus*, *A. admetus*, *A. ripartii*, a small form of *P. dorylas*, and *P. escheri dalmatica*; one male *L. coridon* was caught. About 100m. from the valley on the opposite side of the road a clump of trees was found to harbour a colony of *H. alcyone syriaca* and also *K. roxelana*.

On the 17th July we set out for our final expedition, to eastern Macedonia. We collected at various places on the way to Drama, a small town north of Kavala, including the immediate neighbourhood of the Lion of Amfipolis where we had caught *H. ottomanus* in May 1969, but without any sign of this species on this occasion. Between Amfipolis and Kavala the road runs south of dry hillsides and in and around gulleys were found *L. duponcheli* and *T. balkanicus* quite commonly and also in less arid situations many second brood small *M. trivia*.

On the 18th July we drove north of Drama towards the Bulgarian border for about 25 km., climbing up through the Phalakron mountains to about 650m., almost as far as the village of Volax. The mountains hereabouts are bare and covered only with low scrub but towards the upper reaches of the valley up which the road wound the terrain became progressively greener and the vegetation in the valley more lush. Butterflies were in profusion, and scores were settling

together in damp patches in the bed of a stream. The day was perfect and cloudless and we caught or noted 52 species. The most unexpected catch, taking into account the lateness of the date, was *A. cerisyi ferdinandi*, in the upper part of the valley; two males and two females in fine condition and one rather worn female were taken and several others were seen. In addition, we caught *E. decoloratus*, which was quite common in the upper reaches of the valley, and *C. minimus*, both species we had not seen before. We also came across a colony of *P. tiphonus*, taken by us before only near Florina and a further colony of *A. hyperantus*. Blues were in profusion, including fresh *L. bellargus*, and scores of *M. daphnis* (but only three blue females) and *A. admetus* and *A. ripartii* were to be seen particularly settling on damp mud patches. *A. ripartii* was interesting because the white streak on the hind-wing underside was often absent and was seldom well marked. Some specimens, too, showed traces of marginal lunules on the undersides, illustrating the very close affinity between this species and *A. admetus* with which it was flying. The species could still be separated, however, into two separate series and whether any were hybrids is uncertain. *P. baton schiffermuelleri* was quite common at lower levels in the valley and *L. duponcheli* was also common in lower and drier localities.

On the 19th July we took the road from Kavala east to Xanthi and then went north up a dry rocky pass towards Echinós. Unfortunately, we were stopped about 8 km. from Xanthi at a military check point and could go no further (we had omitted to ascertain whether a permit was required). This was disappointing as we were anticipating that we might do as well as we had done north of Drama. We collected at several places on the way back to Xanthi but only noted common species. Between Xanthi and Kavala, however, we came across another colony of *H. fatua* in an area of sandy heathland and low scrub.

On the 20th July we returned from Kavala to Amfipolis noting further colonies of *L. duponcheli* and *H. fatua*.

We are indebted to Dr. Lionel Higgins for helpful discussions on the identity of several species.

LIST OF SPECIES CAUGHT BETWEEN 2nd-20th JULY 1971

PAPILIONIDAE: 3 species

<i>Papilio machaon</i> L.	Mt. Pilion, Nr. Florina, not common
<i>Iphiclides podalirius</i> L.	Widespread and quite common
<i>Allancastris cerisyi ferdinandi</i> Stichel	Nr. Drama

PIERIDAE: 15 species

<i>Pieris brassicae</i> L.	Widespread and quite common
<i>Pieris rapae</i> L.	Widespread and common
<i>Pieris mannii</i> Mayer	Mt. Pilion, Mt. Cholomon, Mt. Olympos and Nr. Drama
<i>Pieris ergane</i> Geyer	Mt. Pilion, Nr. Florina, Mt. Olympos and Nr. Drama
<i>Pieris krueperi</i> Stdgr.	Mt. Pilion
<i>Pieris napi</i> L., perhaps f. <i>pseudo-rapae</i>	Mt. Pilion and Nr. Florina
<i>Pieris daplidice</i> L.	Widespread and common
<i>Aporia crataegi</i> L.	Nr. Florina
<i>Colias crocea</i> Fourc.	Widespread and common
<i>Colias australis</i> Verity	Nr. Florina and Nr. Drama
<i>Gonepteryx rhamni</i> L.	Widespread and quite common
<i>Gonepteryx cleopatra</i> L.	Thermopylae, Mt. Pilion and Mt. Cholomon
<i>Gonepteryx farinosa</i> Zeller	Mt. Pilion
<i>Leptidea sinapis</i> L.	Widespread and quite common
<i>Leptidea duponcheli</i> Stgr.	Widespread in mountainous districts in the north, e.g., between Florina and Edessa and Nr. Drama and Xanthi

LIBYTHEIDAE: 1 species

<i>Libythea celtis</i> Laicharting	Mt. Olympos, abundant on eastern aspect
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NYMPHALIDAE: 22 species

<i>Charaxes jasius</i> L.	Vale of Tembi, one only
<i>Apatura ilia</i> Schiff. f. <i>clytie</i>	Nr. Florina, one worn female only
<i>Limenitis reducta</i> Stgr.	Widespread
<i>Nymphalis antiopa</i> L.	Widespread but not common
<i>Iachis io</i> L.	Mt. Pilion, Mt. Olympos and Nr. Drama
<i>Vanessa atalanta</i> L.	Mt. Pilion, Mt. Olympos and Nr. Drama
<i>Aglais urticae</i> L.	Nr. Florina
<i>Polygonia c-album</i> L.	Nr. Florina and Mt. Olympos
<i>Polygonia egea</i> Cramer	Mt. Pilion, Mt. Olympos and Nr. Drama
<i>Pandoriana pandora</i> Schiff.	Mt. Pilion, one only
<i>Argynnis paphia</i> L.	Mt. Pilion, Nr. Florina, Mt. Cholomon and Mt. Olympos
<i>Mesoacidalia aglaja</i> L.	Nr. Florina, Mt. Cholomon, Mt. Olympos and Nr. Drama

<i>Fabriciana adippe</i> Schiff.	Mt. Pilion and Mt. Olympos
<i>f. cleodoxa</i>	
<i>Fabriciana niobe</i> L. <i>f. eris</i>	Nr. Florina
<i>Issoria lathonia</i> L.	Nr. Florina, Mt. Olympos and Nr. Drama
<i>Brenthis daphne</i> Schiff.	Mt. Pilion and Nr. Florina, all worn
<i>Clossiana erphrosyne</i> L.	Mt. Olympos, worn
<i>Clossiana dia</i> L.	Nr. Florina, Mt. Olympos and Nr. Drama
<i>Melitaea phoebe</i> Schiff.	Thessaloniki, small 2nd brood, Nr. Florina and Nr. Drama
<i>Melitaea didyma</i> Esper	Mt. Pilion, Nr. Florina and Nr. Drama
<i>Melitaea trivia</i> Schiff.	Widespread and often com- mon, 2nd brood, very small
<i>Melitaea athalia</i> Rott.	Nr. Florina, a few only

SATYRIDAE: 20 species

<i>Malanargia galathea</i> L.	Mt. Pilion, Nr. Florina, Mt. Cholomon, Mt. Olympos and Nr. Drama
<i>Melanargia larissa</i> Geyer	Widespread, occasionally fly- ing with <i>M. galathea</i> . <i>M.</i> <i>larissa larissa</i> , Nr. Florina: <i>M. larissa herta</i> , Volos and Nr. Athens
<i>Hipparchia alcyone syriaca</i> Stdgr.	Mt. Olympos and between Florina and Edessa
<i>Hipparchia semele</i> L.	A single colony between Florina and Edessa
<i>Hipparchia fatua</i> Freyer	Widespread: Thermopylae, Mt. Pilion, Thessaloniki and eastwards to Xanthi
<i>Chazara briseis</i> L.	Widespread in colonies
<i>Pseudochazara anthelea</i> <i>amalthea</i> Frivaldsky	Mt. Pilion, and Nr. Florina, not common
<i>Brintesia circe</i> Fab.	Mt. Pilion, Nr. Florina and Mt. Olympos in colonies
<i>Erebia ligea</i> L.	Nr. Florina, in one colony
<i>Maniola jurtina</i> L.	Widespread and generally common, with extensive orange markings in fe- males
<i>Hyponephele lycaon</i> Kuehn.	Mt. Pilion, Nr. Florina, Mt. Olympos and Nr. Drama, in colonies
<i>Hyponephele lupina</i> Costa	Nr. Florina, Mt. Olympos and Nr. Drama

<i>Aphantopus hyperantus</i> L.	Nr. Florina (two colonies), Mt. Olympos (one colony) and Nr. Drama
<i>Pyronia tiphonus</i> L.	Nr. Florina and Nr. Drama, but not common
<i>Coenonympha pamphilus</i> L. f. <i>lyllus</i>	Common almost everywhere, many of males being <i>marginata</i> forms
<i>Coenonympha arcania</i> L.	Nr. Florina, Mt. Olympos and Nr. Drama, worn but not common
<i>Parage aegeria</i> L.	Nr. Florina, Mt. Olympos and Nr. Drama, not common
<i>Lasiommata megera</i> L.	Widespread and generally common
<i>Lasiomata maera</i> L.	Widespread but less common than <i>L. megera</i>
<i>Kirinia roxelana</i> Cramer	Mt. Pilion in one colony and between Florina and Edessa (one only)

LYCAENIDAE: 38 species

<i>Quercusia quercus</i> L.	Mt. Pilion, in one colony
<i>Nordmannia ilicis</i> Esper	Mt. Pilion, Nr. Florina and Mt. Olympos
<i>Strymonidia spini</i> Schiff.	Mt. Pilion, in several places
<i>Strymonidia w-album</i> Knoch.	Nr. Florina, one only
<i>Strymonidia pruni</i> L.	Between Florina and Edessa, one only
<i>Callophrys rubi</i> L.	Nr. Florina, worn
<i>Lycaena phlaeas</i> L.	Widespread, but never very common; generally dark and some specimens almost black
<i>Heodes virgaureae</i> L.	Nr. Florina, quite common in several localities
<i>Heodes ottomanus</i> Lefèbvre.	Mt. Olympos, one only (a fresh male)
<i>Heodes tityrus</i> Poda	Mt. Pilion, Nr. Florina and Nr. Drama and Xanthi, but nowhere common
<i>Heodes alciphron</i> Rott.	Mt. Pilion, Nr. Florina and Nr. Drama, but nowhere common
<i>Thersamonia thersamon</i> Esper.	Mt. Pilion (a male), and Mt. Olympos (a female)
<i>Palaeochrysophanus</i> <i>hippothoe</i> L.	Nr. Florina, a few only
<i>Syntarucus pirithous</i> L.	Mt. Pilion, Nr. Florina, Mt. Olympos and Nr. Drama, but nowhere common

<i>Tarucus balkanicus</i> Freyer	Nr. Volos, between Florina and Edessa and Nr. Drama in localized colonies
<i>Everes decoloratus</i> Stdgr.	Nr. Drama, quite frequent in one area, mostly worn
<i>Everes alcetas</i> Hoffmannsegg	Nr. Florina, a few only
<i>Cupido minimus</i> Fuessly	Nr. Drama, a few only, worn
<i>Celastrina argiolus</i> L.	Mt. Pilion, Nr. Florina and Mt. Olympos, in small colonies
<i>Maculinea arion</i> L.	Nr. Florina, and Mt. Cholo-mon, a large dark and heavily marked form in colonies
<i>Philotes baton schiff- muelleri</i> Hemming	Nr. Florina, Mt. Olympos and Nr. Drama, not common
<i>Scolitantides orion</i> Pallas	Mt. Pilion and Nr. Drama, not common and mostly worn
<i>Plebejus argus</i> L.	Nr. Florina, Mt. Olympos and Nr. Drama
<i>Plebejus idas graeca</i> Tutt	Mt. Pilion, Nr. Florina and Mt. Olympos, all above 1,000m.
<i>Aricia agestis</i> D. and S.	Widespread but not common
<i>Aricia allous</i> Geyer	Nr. Florina, Nr. Drama and Nr. Xanthi
<i>Aricia anteros</i> Freyer	Nr. Florina, one male only
<i>Cyaniris semiargus</i> Rott.	Nr. Florina, a few worn
<i>Agrodiaetus admetus</i> Esper	Mt. Pilion, Nr. Florina, between Florina and Edessa and Nr. Drama, common in colonies
<i>Agrodiaetus ripartii</i> Freyer	Nr. Florina, between Florina and Edessa and Nr. Drama
<i>Plebicula escheri dalmatica</i> Speyer	Mt. Olympos, between Florina and Edessa and Nr. Drama
<i>Plebicula amanda</i> Schneider	Nr. Florina, a few worn
<i>Plebicula thersites</i> Cantener	Widespread in large colonies
<i>Meleageria daphnis</i> Schiff.	Mt. Pilion, Nr. Florina, Mt. Olympos, between Florina and Edessa and Nr. Drama (in large colonies): only four females caught, one (black) on Mt. Pilion and three (blue) Nr. Drama
<i>Lysandra coridon</i> Poda	Between Florina and Edessa, one only
<i>Lysandra bellargus</i> Rott.	Nr. Florina, Mt. Olympos and Nr. Drama (many)
<i>Polyommatus icarus</i> Rott.	Widespread and common almost everywhere

Polyommatus eroides
Frivaldsky

Nr. Florina, three males
only

HESPERIIDAE: 15 species

Pyrgus alveus Huebner

Nr. Drama, one only

Pyrgus armoricanus Ober-
thur

Widespread but not com-
mon

Pyrgus serratulae Rambur

Nr. Florina, Nr. Drama, and
Nr. Xanthi

Pyrgus sidae Esper

Nr. Florina, one only worn

Spialia sertorius orbifer
Huebner

Widespread and quite com-
mon

Carcharodus alceae Esper

Widespread and quite com-
mon

Carcharodus lavatherae
Esper

Nr. Florina and Nr. Drama,
three females only

Carcharodus orientalis
Reverdin

Nr. Athens, Mt. Pilion and
Nr. Drama, three only

Erynnis tages L.

Thessaloniki, Nr. Florina, Nr.
Drama and Nr. Xanthi,
not common, worn

Erynnis marloyi Boisduval

Nr. Volos, one female only

Thymelicus acteon Rott.

Nr. Florina and Nr. Drama in
colonies

Thymelicus lineola Ochs.

Nr. Florina, in colonies

Thymelicus sylvestris Poda

Nr. Pilion, Nr. Drama and
Nr. Xanthi, not common

Ochlodes venatus faunus
Turati

Widespread

Gegenes nostrodamus Fab.

Thermopylae, one only

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PURPLE EMPEROR IN SURREY. — I can now add to my note (*Ent. Record* **83**; 358). During 1972, three male *Apatura iris* L. entered my friend's house in Surrey between 31st July and 19th August and were, with some difficulty, persuaded to leave. On 8th August his wife noticed a male basking on a flagstone outside the drawing room. Having no better apparatus available, she captured it very simply by putting a tumbler over the top.—J. A. C. GREENWOOD, The Thatches, Forest Road, Pyrford, Woking, Surrey. 30.x.1972.

On some Moroccan Butterflies

By OTAKAR KUDRNA, F.R.E.S.

The butterfly fauna of Morocco still requires a considerable amount of research from both taxonomic and faunistic points of view. As there is no comprehensive recent paper on Moroccan butterflies every record could be of some interest. This lack of records seems a common feature not only of certain areas, but also of certain periods of the year, the latter being one of the causes for writing this paper.

Owing to the extreme kindness of my learned colleagues, Miss Nadya Gawadi and Mr Martin Wilson of the Department of Zoology at Cambridge University, I have been able to study over 50 specimens of butterflies collected in two distinct areas in Morocco at the very beginning of September 1971. Although both N. Gawadi and M. Wilson are not entomologists and travelled for other purposes, they most willingly spent several hours of their valuable time energetically collecting Rhopalocera. I am greatly indebted to them for this favour. All specimens, belonging to nine species, have been deposited in the author's collection.

Collecting has been carried out in two different localities:

Taroudant

A small town on the main road from Marakesh to Agadir on the southern foothills of the Atlas Mountains, some 81 km. east of Agadir, at the altitude of some 250 m or thereabout. Collected on 1st and 2nd September 1971 among orchards, alfalfa fields and on rough uncultivated ground covered with bushes of "maquis" type and low vegetation with numerous flowering Compositae herbs.

Essauira.

A town on the Atlantic coast, on the main road from Agadir to Casablanca, some 176 km north of Agadir, at the altitude of about 20-30 m. Collected on 4th September 1971 mostly on sandy soils among the coastal dunes and rough ground covered with thorny bushes and grass.

The following species have been observed and collected:

Pieris rapae L.

Although all the specimens—except for a single male—are rather small in size, the examination of androconia has shown just the usual broad variability.

Taroudant, 1.2/9/1971 — 2 ♂♂, 3 ♀♀. Essauira, 4/9/1971 — 3 ♂♂.

Pieris brassicae L.

The examination of androconia has shown certain similarity to those of the specimens from the Canary Isles, and, perhaps to a less extent to those from Spain, and

remarkable differences from those of specimens from the other North African countries.

Essaurina, 4/9/71 — 1 ♂.

Pontia daplidice L.

A single worn specimen only.

Essauira, 4/9/1971 — 1 ♀.

Colias crocea Fourcr.

Both males of this migrant species are quite small and freshly emerged, the female is worn and battered.

Taroudant, 1/9/1971—2 ♂♂. Essauira, 4/9/1971—1 ♀.

Danaus chrysippus L.

As this species is regarded as a rare migrant in Morocco, it is very interesting to notice that it was commonly seen flying quickly over rough ground and settling unfrequently on Compositae flowers. Only four specimens were caught owing both to its fast flight and to the roughness of terrain. All of them were caught freshly emerged, but one is badly mechanically damaged. It is understood that the specimens must have bred within the locality.

Taroudant, 1-2/9/1971 — 1 ♂, 3 ♀♀.

Pararge aegeria L.

Only two very small and worn specimens.

Essauira, 4/9/1971 — 1 ♂, 1 ♀.

Syntarusus pirithous L.

Very common on alfalfa fields, but most of the specimens rather worn.

Taroudant, 1-2/9/1971 — 9 ♂♂, 3 ♀♀.

Tarucus theophrastus Fabr.

Common on alfalfa field and in their vicinity

Taroudant, 1-2/9/1971 — 8 ♂♂, 2 ♀♀.

Zizeeria knysna Trimen.

Found sporadically, not common.

Taroudant, 1/9/1971 — 3 ♂♂, 2 ♀♀.

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Some unexpected Lepidoptera in Kincardineshire and Aberdeenshire

By R. M. PALMER

During four years of studying Lepidoptera in North East Scotland I have found the majority of those species stated by South (1962) and Beirne (1954) to occur in either Kincardineshire, Aberdeenshire or both. Of those species covered in the volumes of South in particular a very small number have not as yet been found in the area. Set against these is the occurrence of an approximately equal number of species which I had not expected to find.

Of the nineteen species listed below some have probably occurred in the area for many years but, being scarce or local, have escaped attention in this large area where field workers are few in number.

In a few cases where a species appears to be quite widespread and not uncommon it seems likely that extension of range may have occurred. This may be true of *Lithina chlorosata* Scop., which occurs not uncommonly in several areas of Aberdeenshire and also in areas north of the Moray Firth, whereas in South it is stated to be of casual occurrence north of Perthshire. It may also be true of *Crambus myellus* Hübn., which was unexpected so far from its stated homes around Braemar.

Since, as far as I am aware, recent records from Kincardineshire and Aberdeenshire are few, the following list has been prepared as a first step in what I hope will in future develop into as complete a list as is possible for the two counties.

NOTODONTIDAE

1. *Odontosia carmelita* Esp.

Although known to occur along the Moray Firth coast in the counties of Moray and Nairn and in Inverness-shire, the occurrence of this species in South Aberdeenshire was a surprise. Only a single specimen has been taken so far, at a portable battery-operated trap in mixed woodland near Monymusk. 10.v.69.

DREPANIDAE

2. *Drepana lacertinaria* Linn.

Not uncommon in the large birch woods around Dinnet and Logie Coldstone where larvae have been found regularly since 1968.

ARCTIIDAE

3. *Lithosia lurideola* Zinck.

Abundant at portable trap, Muchalls—August 1970 and July 1971. Larvae often common at Dunnotar Castle. Also recorded from Cove Bay. Probably common all along the

Kincardineshire coast from Stonehaven and Dunnotar Castle northwards.

NOCTUIDAE

NOCTUINAE

4. *Anaplectoides prasina* Schiff.

Quite a common species at light in woods around Newmachar, Dyce, Bucksburn (e.g. 6 at portable trap, Bucksburn, 6.viii.70). Also at Park on Deeside and probably in many other areas.

HADENINAE

5. *Discestra trifolii* Hufn.

Five specimens of this moth came to a portable trap on the cliffs at Muchalls, Kincardineshire, 7.viii.70.

6. *Hadena bicolorata* Hufn.

5 records:—18.vi.68 Dyce 1♂, 12.vii.68 Dyce 1♂, 21.vi.70

Dyce 1♂, 4.vi.71 Dyce 1♂, 22.vii.71 Dyce 1♂.

Strangely, this species has been found nowhere else.

7. *Leucania comma* Linn.

Not uncommon in Durris Forest. Single specimens also found at Kintore and Kemnay.

CUCULLIINAE

8. *Agrochola lychnidis* Schiff.

Common at sugar Muchalls, Kincardineshire—late September 1969.

ACRONICTINAE

9. *Cryphia perla* Schiff.

Not uncommon at Dyce, where it has occurred every year since 1968. Also in the suburbs of Aberdeen and at Cove Bay, Kincardineshire.

AMPHIPYRINAE

10. *Nonagria typhae* Thunb.

1 specimen at m.v., Newmachar—1.ix.68.

1 specimen at m.v., Newburgh—28.viii.70.

CATOCALINAE

11. *Euclidimera mi* Clerck.

Not uncommon at Kintore in late May and early June. A single specimen from Dinnet—8.vi.68.

GEOMETRIDAE

OENOCRROMINAE

12. *Alsophila aescularia* Schiff.

Common at Monymusk and Kemnay.

LARENTIINAE

13. *Lygris mellinata* Fab.

1♂ at m.v.—Newmachar—14.viii.68.

1 at portable trap, Cove Bay, Kincardineshire—August

1969.

- 14.
- Eupithecia abbreviata*
- Steph.

1♂ at portable trap, Tyrebagger Forest, Bucksburn—28.v.70.

- 15.
- Eupithecia tantillaria*
- Boisd.

Abundant among spruce near Huntly in 1969 and 1970. A single ♀ at m.v., Cults 1971.

ENNOMINAE

- 16.
- Erannis aurantiaria*
- Hübn.

Abundant at portable trap, Tyrebagger Forest—1968 and 1969. Larvae were present in vast numbers on birch in the Dinnet area in June 1968. Also common at Kintore.

In contrast with this is the occurrence of *Erannis defoliaria* Clerck. of which species only 1 specimen has been noted in four years (at Durris Forest). I had expected both species to be rare in the area; this seems to be so as regards *defoliaria* but certainly not in the case of *aurantiaria*.

- 17.
- Cleora rhomboidaria*
- Schiff.

Generally distributed and common. (South leaves the Scottish distribution of this species rather doubtful, mentioning its general distribution as far as Perthshire but making no mention of counties to the north of this.)

- 18.
- Lithina chlorosata*
- Scop.

Although nowhere the abundant pest it is in parts of southern England, the species occurs quite commonly at Durris and Cults on Deeside and at Monymusk and Hatton on Fintray.

PYRALIDAE

- 19.
- Crambus myellus*
- Hübn.

Supposedly confined to high mountain valleys around Braemar etc., this species was common at Newmachar in 1968 and has since occurred at Hatton of Fintray (1970), Oldmeldrum and Dyce (common in my garden at portable trap), 1971.

The rather similar species *Crambus pinellus* Linn. has been seen only once during this period—1 at m.v. in a suburb of Aberdeen, 3.vii.68.

Acknowledgments

I would like to thank Mr E. Pickard of Aberdeen for the use of his records. The records of *C. pinellus* and *E. defoliaria* are his, as are all records from Cove Bay and Durris Forest.

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Lepidoptera Review 1971

By T. W. HARMAN

These notes will cover what I consider to be some of the highlights of the year. The season really began on 25th February when several locals went to Broom Ridding Wood, Derbys., to look for *Erannis marginaria* F. They were quite common and a nice series of very dark forms was obtained. Little of consequence happened after this date until 15th April when Mr B. Elliot and I set out for the Isle of Wight. We left Bucks. at 7.00 a.m. and encountered heavy rush hour traffic in the Reading area which heralded a rather uncomfortable journey to Portsmouth. The cafe at the ferry was one of the worst we had ever come across and is well worth avoiding. After driving across the island in foggy conditions we walked to the locality where we hoped to obtain a few larvae of *Melitaea cinxia* L. It took some time to find the exact spot, but once among them there was no difficulty in seeing them. They crawled over the low herbage in thousands and if their numbers in other localities are similar, the status of this species must be quite safe at present. We only found one larva of *Arctia villica* L. Return to the mainland was made via Yarmouth to Lymington, a more pleasant ferry, we thought. We then motored to Warminster where we stayed with Mr and Mrs R. Stockley. The plan was to try some local collecting that night, but after a wonderful meal, a bottle of wine and such a hard day, we thought better of it. The next day, 16th April, we started by beating yew trees at West Dean, Wilts., for larvae of *Deileptenia ribeata* Clerck. Very few larvae of any sort were seen and the four hopeful-looking ones we did get turned out to be *Cleora rhomboidaria* Schiff. From here we travelled back to Bucks. and in the evening made a sortie to Burghfield, Berks., to search for larvae of *Polia hepatica* Clerck. An hour in a previously good area yielded nothing, a curious blank which we have been unable to explain, except for the possibility they might already have pupated. On the 17th April a number of larvae of *Euphydryas aurinia* Rott. were seen in an Oxfordshire locality and from there we returned to Chesterfield.

The first two specimens of a nice series of *Rheumaptera carvinalis* Scop. emerged on 26th April. These were the result of larvae obtained in the classic locality at Bury St. Edmunds, Suffolk in 1970, unfortunately a threatened area, due to development. The next significant event concerned *Aegeria culiciformis* L. on the local moors above the 1,000 ft. contour. A visit was made on 22nd May when signs of tunnels in birch stumps could be seen by fresh 'sawdust' sticking out. We obtained several pupae and two had emerged on arrival at home, obviously the disturbance had hastened their desire to escape the pupal state. The following day Mr B. Elliot and I repeated the operation, but cut complete stumps on this occasion and placed them in large, muslin-covered buckets. By this method we each bred a nice series. My family spent Whitsun at Turville Heath, Bucks., and on the night of the 30th May a good selection of typical

chalk species came to m.v. light, including *Ectropis consonaria* Hubn., *Acasis viretata* Hubn., *Abraxas sylvata* Scop., and *Cosymbia linearia* Hubn. On the 31st we visited the small colony of Military Orchids, the third British colony, discovered in 1970. Again there were two flowering spikes, even better specimens than in the previous year.

June was a rather inactive month this season, but I did manage a weekend in Bucks. on the 25th where, to my surprise, I took a specimen of *Trisateles emortualis* Schiff. at light. This is about the earliest date for the species I have known. With it was a specimen each of *Apamea epomidion* Haw. and *A. sublustris* Esp., both welcome sights. The end of the month saw some excellent nights for insects in Chesterfield, but my house is not in a good enough position to draw many rarities, the best species at this time being *Unca triplasia* L.

July opened in fine style with Mr B. Elliot, Mr T. J. G. Homer and myself setting out on the 3rd for a visit to the Lake District. Mr Homer wanted *Erebia epiphron* Knoch and, as we had also decided to visit Arnside, an overnight stay was desirable. *Epiphron* was found to be less common than on a previous visit, but we think we might not have been in the best locality. However, as a bonus, we got several specimens of *Parasemia plantaginis* L. var. *hospita*. Series of *Colostygia salicata* Hubn. and *Xanthorhoe munitata* Hubn. were obtained by brushing large, vertical rock faces with a long, slender stick. While one person used the stick, the other wielded the net as insects flew off. Working in pairs is much better than singly and it is advisable to take a long stick up with you as they are unobtainable on the high ground frequented by the moths. We then travelled to that old entomologist's mecca, the 'Derby Arms' at Witherslack where we had previously booked. It is now under new management and we had quite a task 'training' the new proprietor, Mrs Parry, and her staff, as to our needs. They all proved very hospitable and we set up a m.v. trap outside the hotel as well as receiving excellent service inside the building. Portable m.v.'s were used at Meathop Moss that night and, although conditions were excellent, nothing remarkable for this area was seen, the best insects being a single *P. hepatica* Clerck., *U. triplasia* L. and *Venusia cambrica* Curt. At the hotel, among many moths were two specimens of *Plusia bractea* Schiff. At Meathop on the following morning, 4th July, *Coenonympha tullia* Mull. was fairly common, but many were worn. We also saw two specimens of *Diacrisia sannio* L. In the afternoon Arnside Knott proved very pleasant despite the lack of sunshine. This did not prevent *Prothodes captiuncula* Treits. from flying, in fact they flew with rather less energy than in sunshine and were quite easy to net. We also saw a few larvae of *Hamearis lucina* L. and two specimens of *Clossiana selene* Schiff. On the way down the hillside we came across some magnificent examples of the Dark Red Helleborine, the first time I had seen this impressive orchid.

The 11th July saw Mr B. Elliott and I back in Bucks. en route for Dungeness, Kent. On a very hot afternoon in a local Chiltern

valley we saw several *Argynnis aglaia* L. The half dozen netted were all males. *Strymonidia w-album* Knoch was very common at privet blossom and there were good numbers of other species flying. At night we ran two m.v. lights, one inside a beechwood and one just outside. Among large numbers of moths were five specimens of *T. emortualis* Schiff. The next day, we travelled on to Dungeness, a nerve-wracking journey as are most south of the Thames. Our nerves were even more frayed upon arrival when we discovered that the old school on the Ness had been bulldozed into a hollow in the shingle. Apparently, it had been declared unsightly for a visit to the area of the Duke of Edinburgh. Generations of entomologists will lament its loss because not only was it a very good landmark, it possessed its own small eco-system and afforded shelter to a variety of wildlife. Apart from the super-abundance of sallow which seems to have increased enormously since the building of the power stations, we felt the area was somewhat over-grazed by rabbits. We had decided to spend a fair percentage of our daytime activities in the Orlestone Woods complex. Here, we were disappointed at the numbers of *Limenitis camilla* L., they appeared to be very localised and were not fresh, even at this date. In the afternoon, on the way back to the Bird Observatory, we stopped at the gravel pits to try for pupae of *Nonagria sparganii* Esp. in reed stems and were quite successful. Light that night was poor with very little seen, but results improved on subsequent nights and we obtained short series of *Nola albula* Schiff. and *Eilema pygmaeola* Doubl. Only two specimens of *Thalera fimbralis* Scop. were seen. Probably the best record at Dungeness was a single *Leucania obsoleta* Hubn. taken at m.v. close to Boulderwall Farm, believed to be the first record for the area.

At Orlestone on the night of 14th July, m.v. lights produced 71 species with a single *Heterogenea asella* Schiff. as the high-light, the first either of us had seen. While checking my diary of the Dungeness trip I saw that Mr B. Elliott, had added his own note to my records for the 15th. It reads, "Did nothing but lie in the sun all day". This is not quite true as I did hunt for cocoons of *Synaphe punctalis* F. among the moss on the shingle at the same time! We had to leave the area on the 16th and travelled back to Bucks. via Sussex where we tried for a few pupae of *Nonagria algae* Esp., this turned out more difficult than on our previous visit.

My family and I went back to Bucks. for the start of the school holidays on 27th July. Two m.v. lights at Turville Heath yielded good results and that night some insects of note were a single *Oria musculosa* Hubn., *Lophopteryx cucullina* Schiff., several *Eilema deplana* Esp. and *Cosmia pyralina* Schiff. Mr T. J. G. Homer and I visited Pamber Forest, Hants. on the 28th, hoping to see *Catocala promissa* Schiff., but we were unlucky, although we got a nice varied series of *Lymantria monacha* L. My family then moved to Kent on the 30th July, where we spent the time between visiting the beaches and blackcurrant picking. M.v. light was used at Worth and among the most interesting

species seen were *Apamea oblonga* Haw., *Leucania straminea* Treits., *Nonagria dissoluta* Treits., *Catocala nupta* L. and *Evergestis extimalis* Scop. While on Dover East Cliffs on 3rd August surveying the docks like a huge toyland below us, I took the opportunity to wander the chalk downs and found a local colony of the second brood of *Cupido minimus* Fuessl. On the last night in Kent, the 11th August, a female *Simyra venosa* Borkh. came to the m.v. trap, the second I have taken there. Although saved for ova she did not oblige.

We then returned to Derbyshire for a few days to see if our home was still standing and then went to West Wales and camped on a farm at the village of Aberech, near Pwllheli. Permission was obtained to run a trap from one of the farm buildings, but results were not very rewarding, due mainly to poor nights. One specimen of *Herse convolvuli* L. on the night of the 25th August was the only good thing seen. A number of visits were made to surrounding areas and one of the most interesting places seen was Aberech beach where sand dunes give way to marshes, all within a few hundred yards. A web containing larvae of *E. aurinia* Rott. was found here. One rather remarkable find was a specimen of *Tholera cespitus* Schiff. which had been trapped by the hooks on a flowerhead of Burdock. We found other insects which had suffered the same fate. On the morning of the 21st August, I walked the entire length of the West Beach at Pwllheli and was surprised to see so many butterflies, including several specimens of the second brood of *C. selene* Schiff., all worn, *Maniola tithonus* L. and singletons of *Eumenis semele* L. and *Thecla quercus* L., the latter caught after a long chase, during which I had hoped it was *T. betulae* L!

Some good woodlands were seen inland, but poor weather at night prevented exploration with portable m.v. The last field trip there was made with Mr Vaughan Jones of Pwhelli, a very enthusiastic naturalist and biology master at the local school. We undertook a hazardous journey around the foot of the huge headland at Llanbedrog to a small gully in which grew a variety of plants, was out of the wind, and had been declared good during daylight. We made it without mishap and set up the m.v. light at the foot of this wonderful cliff. Results were disappointing although we got eight lovely fresh specimens of *Stilbia anomola* Haw. Return to Chesterfield was made on 30th August after a very enjoyable visit to a part of the country still beautiful, but rapidly losing its appeal because of hordes of people and increasing restrictions in accessible parts of the coast.

The rest of the season was spent locally and one of the best nights was on the 10th September in Clumber Park, Notts. when we saw 32 species among which were the local specialities, *Enargia paleacea* Esp. and *Diarsia dahlia* Hubn., together with *Aporophyla lunula* Stroem, *Cirrhia gilvago* Schiff., *S. anomola* Haw., and a single female *Orthonama lignata* Hubn., the first we had seen in this area. A further visit on the 18th resulted in the near-freezing temperature with more entomologists than moths, and precious few of either! The season was brought to a

late end during the Christmas holiday at Turville Heath, Bucks. Some very mild nights brought out several species and I was able to get some nice forms of *Erranis defolaria* Clerck.

26 Highfield Road, Chesterfield, Derbyshire.

Notes on *Zygaena* in 1972 and a Holiday in West Scotland

By N. GILL

After becoming increasingly interested in the Zygaenidae I considered the possibilities of taking a holiday in West Scotland with a view to visiting some of the localities of the local species.

Eventually I planned a family holiday for late June, the object being to combine a touring holiday of West Scotland with searching for some of the Scottish subspecies of the genus *Zygaena*.

We left Huddersfield at 7.30 p.m. on 23rd June and arrived at our previously arranged accommodation at Eastrigs, Dumfriesshire, late that evening. On the 24th we motored north to Oban and by way of the Erskine Bridge over the Clyde, Loch Lomond and Inverary arrived there in the early evening. At 7 p.m. we boarded the car ferry to the Isle of Mull and arrived at Craignure at 7.45. On arrival we immediately started motoring north and eventually found accommodation in the small village of Dervaig in the north of the Island. Since it had rained for most of the day, I waited eagerly for the weather forecast on television that night. Fortunately the forecast was brighter weather, which pleased me as I had planned to visit Loch Tuath on the west coast of the island, a locality for *Z. loti scotica* Rowland-Brown.

The morning of the 25th was brighter, though mainly cloudy as we drove down the coast. On arriving, I walked to the shore and began to search for likely *Zygaena* habitats. After a short while I found a patch of *Lotus corniculatus* upon which was a single *Z. loti scotica*. I was surprised to have found *loti* in such a short time, and in high spirits I walked along to a more likely looking part of the shore. Here, after much searching, I found *loti* in some numbers. There was a fresh breeze from the sea, and the moths were found, some freshly emerged, low down on the short herbage. In the afternoon the sun made an appearance and another search was made at the *loti* colony. This time the moths were to be seen more readily.

Later in the afternoon, we visited Calgary Bay, which we had passed on our way down to the coast that morning. After a long search I eventually found a strong colony of *Z. purpuralis caledonensis* Reiss, situated on a high steep bank above the bay, and the moths were in a beautiful, freshly emerged condition.

On the 26th we motored to Carsaig Bay on the south coast of the island, where I searched the steep slopes above the bay, but did not find one single *Zygaena*. On returning to our hotel at Dervaig, I called at the *loti* colony and noted a few specimens on the herbage. Not being able to resist another look at the *purpuralis* colony at Calgary, I also stopped there, and high up on the slope the moths were very common.

On the morning of the 27th we left Dervaig for Craignure where we boarded the car ferry for Oban. The weather had again deteriorated, being dull and very wet, and on arriving on the mainland we headed north for the Isle of Skye. That evening we arrived at Fort William, having taken the short cut across Loch Leven by way of the Balachulish ferry. We decided to stay at Fort William that night and continue on to Skye next morning.

The next morning we visited Glen Nevis before heading north for Skye via Spean Bridge and Invergarry. On the highest mountains north of Fort William there were still large patches of snow. We arrived at the Kilerhea ferry in the late afternoon and were soon on the island and motoring to Portree where we were to stay for three nights.

The 29th was mainly sunny and warm and we visited Talisker on the west coast. I searched the banks and slopes above the shore and found a number of *Zygaena* cocoons which, between 13th and 17th July produced *Z. lonicerae jocelynae* Tremewan. A few *jocelynae* larvae were also found; they were feeding on *Lathyrus pratensis*. Cocoons of *purpuralis* were noted in some numbers attached to the rocks, but as yet, moths were very scarce. At Talisker I also found *Setina irrorella* L. and *Eupithecia pulchellata* Sheldon.

The morning of the 30th was cloudy with a strong wind and I revisited Talisker where I found a few more cocoons which eventually produced a few *Z. filipendulae anglicola* Tremewan. In the afternoon we visited Dunvegan Castle. The weather had become worse with rain or drizzle in the strong wind.

On the morning of 1st July we began making our way home and by the way of the Kyle of Lochalsh ferry, we reached the mainland, eventually arriving home via Edinburgh and the A1 road on the afternoon of 2nd July. Thus ended a wonderful holiday which, in spite of the unsettled weather, had been extremely enjoyable, and highly successful in its object.

On the Saturday after our return from Scotland (8th July) we visited Filey on the Yorkshire coast, the type locality of *Z. lonicerae latomarginata* Tutt and on arrival I searched the slopes above the shore. It was dull and wet, but *lonicerae* was found to be common and freshly emerged, resting on the herbage. Two *Z. f. anglicola* were also found; these were of the seasonal form *stephensi* Dupont, with the broad hindwing border and the small sixth spot through which runs a dark coloured nervule.

On the 9th July I paid a short visit to a *Z. lonicerae transferens* Verity colony at Emley, but although cocoons were numerous, the moths had not yet begun to emerge. The colony is situated on a small, old spoil heap of a coal mine upon which there is a good growth of *Lotus corniculatus*. On the 16th I made a visit to another *transferens* colony at Emley; the moth was common and active in the warm sunshine. This colony is situated on a long narrow piece of rough land which runs alongside a country lane.

A pair of *Z. loti scotica* found in copula at Loch Tuath on 25th June was kept in a glass bottomed box in the hope of obtaining eggs. On the 2nd July a small batch of yellow eggs was noticed on the side of the box, and on the 6th another batch was found to have been laid. The moth also laid small batches on the 13th, 17th, 18th, 19th and 20th July. On the 13th July, the first batch of eggs had changed to a grey colour and on the 14th they produced greyish green larvae. These were placed in a plastic container with some *Lotus corniculatus* upon which they commenced to feed. On the 17th, the batch of eggs laid on the 6th also produced larvae which were treated in the same way. The small batches of eggs laid between 13th and 20th July proved to be infertile.

During this time, the moth was kept alive by feeding it with sugar dissolved on a moist pad of cotton wool, which it accepted readily. The moth finally died on the 21st July, almost four weeks after it was found, and the day after it had laid its last batch of eggs.

At the time of writing, some of the larvae have just changed their first skin and are growing very slowly, being about one eighth of an inch in length.

26 Mount Pleasant, Emley, Huddersfield. 30.vii.1972.

Microlepidoptera in Gloucestershire

By J. NEWTON B.Sc., F.R.E.S.

In my previous paper on this subject (*Ent. Record*, **73**: 86) I reported a few species of the so-called Microlepidoptera which had come my way since 1953 in Gloucestershire. Here I give a few more which I have recorded since 1961, some of which are new county records and some of which have not been seen for many years, or I have found in new localities in the county. Some parts of the county have changed considerably since T. Bainbrigge-Fletcher and T. Glanville Clutterbuck compiled *The Microlepidoptera of Gloucestershire* in 1938, and although these changes are not all in favour of the survival of some species, it is nevertheless pleasing still to be able to find new species and the spread of others in the county.

PYRALIDINA

Dioryctria abietella D. & Schiff. In the Gloucestershire list there are two records only, one for the Stroud district (Davis,

1902) and an undated record for Gatcombe (J. W. Metcalfe). Fletcher adds a note saying that the species of the genus required revision. This has since been thoroughly dealt with by M. Shaffer (*Ent Gazette*, **17**: 20) and *D. sylvestrella* Ratz. (= *spendidella* H.-S.) has been removed from the British list, leaving only one species of *Dioryctria* viz. *abietella* and placing *mutatella* as a form of *abietella*. On this basis, and having examined the few specimens I have in my collection, I find that I have taken *D. abietella* once only at Westonbirt, 15th July, 1964. The form *mutatella* I have taken at Westonbirt on 23rd June, 1941 and at Cannop (Forest of Dean) on 5th September, 1964.

Pyrausta funebris Stroem. Clutterbuck took this species at St. Briavels (Forest of Dean) in 1933. Wotton-under-Edge and Grange Court are given in Perkin's List (1901). I found specimens at Randwick Park near Stroud and at Sapperton in June 1969.

Euzophera terebrella Germ & Zinck. T. B. Fletcher had the only previous record for the county at Rodborough in 1936. I had one specimen at mercury vapour light on 9th August, 1963.

Acrobasis tumidana D. & Schiff. I took a fresh specimen at mercury vapour light at Westonbirt in July 1964. This is a new county record.

PHALONIIDAE

Phtheochroa rugosana Hübn. I have collected larvae of this species over a few years in Hertfordshire, Oxfordshire and Nottinghamshire, and in my experience they are frequently full-grown before the berries of *Bryonia dioica* are formed. The larvae then are found spun up chiefly in the flowers. It was not until August 1967 that I found my first larvae in Tetbury and again here in July 1970. There are only a few old records in the Gloucestershire list.

Acornutia nana Haw. Only one note in Perkin's List (1901) which gives no definite locality. I took one at Cannop (Forest of Dean) at mercury vapour light in June 1967.

TORTRICIDAE

Epinotia signatana Dougl. Only one record for this species in the Bristol area, and given by Perkins as "scarce amongst aspens". I have collected it at Inglestone Common for several years, but always from blackthorn (*Prunus spinosa*).

Epinotia rubiginosana H.-S. I took this species first in July 1965 from *Pinus sylvestris* at Painswick. This is a new county record.

Epigogue grotiana Fabr. Not previously recorded south of the Severn in Gloucestershire, and only old records from the Forest of Dean area. I have had it since July 1965 in the Cannop area only, but by no means common.

Acleris hastiana L. Only two old records for the Bristol area in Perkin's List. In 1956 I found a small colony at Inglestone Common and collected a few larvae in August. Moths emerged in September, and compared with larger colonies I

know in other parts of the country, there seems to be very little variation here.

OLETHREUTIDAE

Lobesia littoralis Curt. This species, as Clutterbuck suggested, must frequently get introduced inland on plants of *Statice armeria*. Mr L. Price had it several years in his garden at Stroud, and in September 1971 it turned up in my garden at Tetbury where I have plants of *armeria*.

Lobesia abscissana Doubl. I have collected this species over a few years in Hertfordshire, but not in Gloucestershire until 1970, when, on 3rd August, I was pleased to get one in my mercury vapour light trap. This is a new county record.

Endemis profundana D. & Schiff. Only two records for the county, the last being at Longhop (Forest of Dean) in 1907 by Clutterbuck. I found it first at Inglestone Common in 1961. Also I have taken it at Dymock in 1961 and at Cannop in 1962.

GELECHIIDAE

Pseudotelphusa scalella Scop. This species has not been recorded for the north side of the Severn since 1920. I have taken several in recent years from the Cannop area, and also south of the Severn at Inglestone Common on 8th June, 1962. I have not seen it in the Tetbury area but oddly enough, I find it plentiful in woods on the Glos-Wilts border.

Telephila schmidiella Heyd. All that one learns from the Glos. List is "one specimen possibly taken near Stroud in 1902", and from the Bristol area in Perkin's List (1901). I have found larvae in *Origanum* since 1961 and found the moths easy to breed.

Telephusa luculella Hübn. Not previously recorded in south Gloucestershire and rarely in the Forest of Dean. I found it first at Cannop in July 1965. It is common in oak woods on the Glos.-Wilts. boundary where I took it in 1967 and 1970.

COLEOPHORIDAE

Colephora albicosta Haw. Perkin's List (1901) gives "abundant among furze" with no actual localities, and Fletcher & Clutterbuck's List has only one other record, "Sheepscombe, June 1924, one specimen, Clutterbuck". I have known it amongst furze in the Brierley area (Forest of Dean) since 1964.

Colephora albitarsella Zell. Records in the county are very few, and none since 1916. I found two of the black cases on *Origanum* at Avening on 30th May, 1956. Moths emerged in July.

OECOPHORIDAE

Semioscopis avellanella Hübn. Although the small-leaved lime (*Tilia parvifolia*) has been generally regarded as the food-plant of this species, I can confirm Mr S. Wakeley's observation that they are also on birch. I found them quite common at Dilke (Forest of Dean) in a birch wood in April 1965 with no lime present. I have also taken it amongst birch at Cannop in 1966.

GLYPHIPTERIGIDAE

Simaethis pariana Clerck. Not recorded since Perkins (1901) who gave two localities in the Bristol area. While beating in Highnam Wood near Gloucester, I got my first specimen on 22nd December, 1964. I believe it is still a rare species in the county.

EPERMENIIDAE

Epermenia illigerella Hübn. All previous records of this species were centered round Gloucester City and the Severn, the last being at Sandhurst in 1930 by Clutterbuck. I found it at Inglestone Common in June 1961 and in subsequent years at other places where *Angelica* grows, particularly on the Glos-Wilts boundary.

PLUTELLIDAE

Ypsolophus mucronellus Scop. (= *caudellus* L.) To Mr L. Price's report that he took this species north of the Severn in 1956 and 1957, I can now add that I took it south of the Severn at Inglestone Common in March 1961 and in April 1963. Also on 6th May, 1969 I had a specimen in my mercury vapour light trap in Tetbury.

Description of a new species of Dermaptera from the Solomon Islands

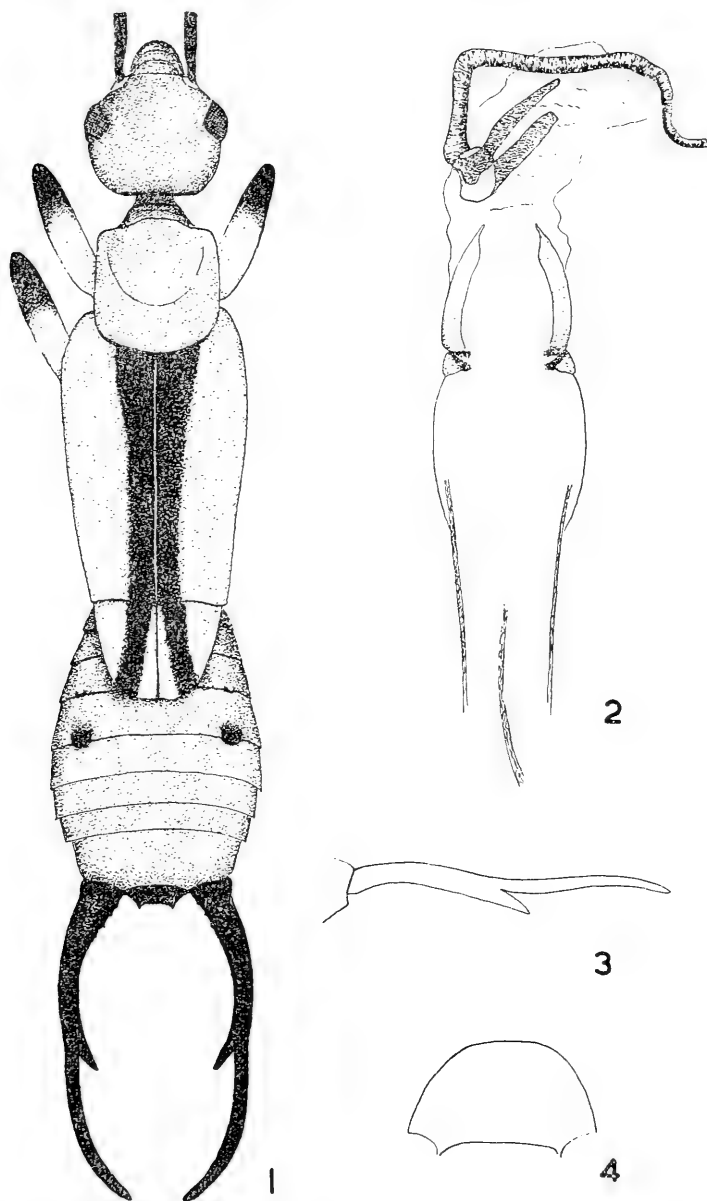
By A. BRINDLE
(Manchester Museum)

Subsequent to a published survey of the Dermaptera of the Solomon Islands (Brindle, 1971), a few additional specimens of these insects from the same islands have been examined. These specimens were collected by Dr. A. B. Gurney, of the Systematic Entomology Laboratory, USDA, United States National Museum, to whom my thanks are due. Amongst the specimens is a single male of a new distinctive and colourful species of the family Chelisochidae, which is described in the present paper. This species, which I have pleasure in naming after the collector, keys down to the genus *Gressittolabis* in Brindle (1971), in which genus it is therefore placed. The male genitalia of the new species show some differences to those of the only other species of the genus, *G. delicatula* Brindle, particularly in the shape of the parameres and the length of the virgal sclerites, but both species are similar in general external structure.

Gressittolabis gurneyi sp.n.

Head, pronotum, and abdomen deep reddish-yellow; antennae blackish, segments distal to eleventh slightly paler in colour; elytra yellowish-brown, broadly black along sutures; wings similar in colour to elytra but black band diagonal, leaving most of the sutural margin yellowish-brown; femora yellow, distal half or so black, tibiae blackish, tarsi dark brown; forceps blackish-red. Cuticle of head and pronotum entirely smooth, impunctate

and glabrous; of elytra and wings coriaceous, impunctate and glabrous; of abdomen sparsely punctured, except last tergite which is almost impunctate; all cuticle shining.



Figs. 1-4—*Gressittolabis gurneyi* sp.n., male: (1) dorsal view, (2) genitalia, (3) forceps branch, lateral, (4) penultimate sternite.

Male (fig. 1): head transverse, tumid, narrowing posterior to eyes, postero-lateral angles scarcely marked, posterior margin straight except at vertex, which is faintly concave; eyes protruding, relatively large, but shorter than the length of head behind eyes. First antennal segment long and narrow, longer than the distance between the antennal bases; second segment transverse; third and fifth segments two and half times as long as broad; fourth segment twice as long as broad; distal segments three times as long as broad, almost cylindrical, but slightly and evenly

narrowed to bases; all segments with short dark pubescence. Pronotum almost quadrate, slightly wider posteriorly, posterior margin convex, anterior half (=prozona) swollen, posterior half (=metazona) flattened and contiguous with a wide lateral explanate border. Elytra and wings long. Legs relatively slender, with short pubescence and a few longer yellow hairs (only anterior and middle legs present on left side and only anterior leg on right side).

Abdomen broadened medially, short; lateral tubercles on third tergite absent, those on fourth relatively large and blackish; last tergite transverse, posterior margin oblique laterally, and weakly concave medially. Penultimate sternite with posterior margin mainly evenly rounded, slightly truncate at apex (fig. 4). Each branch of forceps trigonal at base, with a dorsal longitudinal ridge, base broadened, and inner margin with a few isolated crenulations; branch sinuate and inner margin with a large, almost ventral tooth near mid-point (figs. 1, 3); pygidium black, short, narrowed distally, with two short projections on posterior margin. Genitalia of type everted (fig. 2), with narrow parameres, virga long, sclerotized, and associated with two long basal virgal sclerites. Length of body 6 mm., forceps 2.5 mm.

Female: unknown.

HOLOTYPE ♂: SOLOMON ISLANDS—Bougainville, IX-'44 (A. B. Gurney) (United States National Museum).

The two species of *Gressittolabis* now known may be separated as follows:—

1. Body almost uniformly blackish-brown; femora and tibiae yellow, each with a broad dark brown median ring; forceps of male with two teeth on the inner margin of each branch; pygidium with posterior margin strongly concave; parameres of male genitalia broadened medially *delicatula* Brindle
- Body variegated in colour, reddish-yellow, yellowish-brown and black; femora yellow, blackish distally, tibiae uniformly blackish; forceps of male with a single tooth on the inner margin of each branch; pygidium with posterior margin slightly concave; parameres of male genitalia narrow, more or less parallel-sided, except at apices *gurneyi* sp.n.

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Wicken Fen Archives

By JOHN SMART

Wicken was famous as an area for collecting Lepidoptera and other insects long before the National Trust became the owner of the areas that constitute the present Nature Reserve. Apart from the valuable papers that appeared under the editorship of the late Professor Stanley Gardiner (1923-32) — which, themselves, probably make Wicken Fen the best documented Nature Reserve

in the U.K.—there is a paucity of detailed accurate information on the Lepidoptera and other fauna at an earlier date. Furthermore, in spite of the issue of many permits to collect, singularly little has been fully recorded in print about the butterflies and the 'macros' since.

The need for organised archives has been apparent to the Wicken Fen Local Committee of the National Trust for some time and the Committee has recently made a temporary appointment of an experienced individual to carry out a pilot project on the Committee's papers and other records with the feasibility of the preparation of a full archive of available documents and records as the final objective.

The lack of such an archive became very apparent to the writer when he recently sought actual dated records of the occurrence of certain butterflies, that are no longer found on the Fen, for the preparation of a guide (Smart, 1972) to the butterflies in the present series of Guides that the Committee is publishing for the National Trust. There must be large numbers of specimens taken on the Reserve at Wicken recently as well as earlier dates scattered in various collections. Singularly little material from the Fen has been deposited in the Cambridge University Museum of Zoology and the Farren collection, which was the basis of the list of Lepidoptera in Stanley Gardiner's volume, is known to have been dispersed. Actually, thanks to the recent work of Lt. Col. A. M. Emmet (1972), we now know more of the status of the Microlepidoptera of the Fen than we do of the Butterflies and the larger Moths.

The purpose of this note is to appeal to anyone who has lists of insects taken on the Fen, especially if these are backed up by the existences of voucher specimens, to get into touch with me or the Warden-Naturalist at the Fen itself, with a view to depositing such lists in the proposed archives or of permitting them to be photo-copied for this purpose. We would also like to have information about the existence of collections with extensive series of Wicken specimens in them. The Committee regrets that it cannot, at the present time, offer to examine such collections and prepare lists.

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EDITORIAL

The time has now come when, in the interests of *The Record*, I should quit the Editorial seat to make way for a younger man. As from January 1st 1973, Mr J. M. Chalmers-Hunt F.R.E.S., will edit the magazine: he needs no introduction from me as he has the reputation for being one of our most prominent amateur entomologists. I shall remain on the editorial panel to give any help which may be required of me and which I may be able to give, but I have every confidence that, with the same help which contributors gave to me, he will maintain the quality and popularity which *The Record* has enjoyed in the past.

The Record suffered considerable set-backs through two editors, Hy. J. Turner and T. Bainbrigge-Fletcher dying "in harness", and within a very short time of each other, thus making it necessary for their successors to start from scratch, and we were indeed fortunate to have T. B. Flecher and Dr E. A. Cockayne to pick up the reins on these two sad occasions. The journalistic ability of P. B. M. Allan brought the magazine to its present standard, and it has been my pleasure to follow him and to try to maintain the quality which he had instilled into *The Record*. This was seventeen years ago, and in standing down, I would like to thank all those who have worked with me on the production of the magazine, and all those who have worked so hard to contribute so much valuable and readable material to its make-up. These contributors have ranged from young readers to professional entomologists, and their efforts are very greatly appreciated. I look forward to many volumes of *The Record* which I have not read before their appearance, and I assure Mr Chalmers-Hunt of my best wishes for his success.—S. N. A. JACOBS.

Notes and Observations

CAMBERWELL BEAUTY IN HERTFORDSHIRE.—I am writing to inform you that during the past week, a Camberwell beauty has been seen a number of times in and around Welwyn Garden City. It was first reported in the garden of a neighbour just opposite me, near the town centre. It stayed long enough for her to study it closely and even sketch it. Unfortunately, although she knew me, she was not aware that I had been a keen studier and collector of butterflies for 60 years. However, I managed to get a note into our local paper just before publication, and received three telephone calls from people who had also seen it, both in gardens and fields near the town.

There is no doubt at all of its identity from their descriptions, but in spite of several sorties, I was unable to see it myself. There may, of course, have been more than one. I should be interested to hear whether there have been any other reports of this rare migrant either this year or last.—ALAN BELL, M.A., 53 Parkway, Welwyn Garden City, Herts. 25.ix.1972.

PROCUS VERSICOLOR BORKHAUSEN IN DERBYSHIRE.—As a result of genitalia checks upon various melanic specimens of *Procus* species by Mr T. H. Ford of Sheffield, two specimens of *P. versicolor* have been identified.

These specimens were taken at separate localities in the Ford valley in North-east Derbyshire during July 1972. I took one specimen at m.v. light on 20th July and a friend, Mr E. C. Waller, took the other at m.v. during the same week.

This species does not appear to have previously been recorded from Derbyshire though, due to its similarity with other *Procus* species, it could well have been overlooked.—F. HARRISON, 24 Church Street, Holloway, nr. Matlock, Derbys. 26.ix.1972.

CELERIO GALII DENIS & SCHIFFERMULLER (BEDSTRAW HAWK) IN KENT IN 1972.—Mr Andrew Ruck had a *D. galii* in the mercury vapour light trap in his garden at Wrotham, Kent, on 20th July this year. He does not collect lepidoptera but today showed me a fine coloured photograph that he took of the specimen.—J. M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham, Kent. 19.ix.1972.

CALOPTILIA RUFIPENNELLA HÜBNER.—In my account of the life-history of this species (*Ent. Record*, 83: 291) there were two gaps. I did not know the position of the egg or the situation of the cocoon in the wild. The gaps can now be filled.

The reason why I could not find the egg in 1971 was that the leaves then under scrutiny were ageing and discoloured, a condition that obscured fine detail. This year I visited Chippenham Fen on the 5th of July and collected one or two of the early mines. The ovum was readily apparent on these fresh leaves, being laid where one would expect it, close to the midrib on the underside. The young larva mines towards the petiole until its progress is arrested by a branch nervure, the tiny mine then filling the angle made by the two veins.

During the first half of September, I spent a week with a small party of entomologists at Thorpeness on the Suffolk coast. In my previous article I had hazarded the opinion that *rufipennella* would probably turn out to be widespread in East Anglia, and with this thought in mind we searched a sycamore wood in the Thorpeness area. The larval cones (vacated at that date) proved plentiful, and both Mr E. C. Pelham-Clinton and Mr D. W. K. ffennell found cocoons; these were spun in a slight hollow on the underside of sycamore leaves. By the date of our visit the moths had already emerged, but in one instance a parasite was reared from the cocoon. The moths flew naturally or were tapped from branches in the late afternoon and Mr Pelham-Clinton, Mr ffennell, Dr J. D. Bradley and the Rev. D. J. L. Agassiz all secured single specimens.

May I remind readers that the vacated larval cones are conspicuous as long as the leaves remain on the trees. The season for searching for new localities of *rufipennella* is therefore from June, when the larva starts feeding, until late October when the leaves fall.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 18.ix.1972.

FURTHER NOTES ON *STENOPTILIA SAXIFRAGAE* FLETCHER.—Last year I wrote a short note (*Ent. Record*, 83: 358) about the discovery of *S. saxifragae* in a garden at Sheffield. Last autumn a new occupant took over the tenancy of the house and, as a result of his intention to clear a good deal of the saxifrage from the garden. I removed three patches of the plant to my own garden at Holloway. During the winter months, no further attention was paid to the plants until I discovered seven small larvae on terminal shoots on 16th April, which prompted me to remove a piece of saxifrage, approximately one foot square, into my greenhouse.

This brought about a rapid acceleration of the growth of the larvae and on 6th May, 23 were noted on this small piece of the food-plant. At this date there was already a considerable disparity in size and coloration of the larvae, the largest being 10 mm and the smallest 2 mm in length. They were clearly visible whilst feeding on the terminal shoots, and when small were pale green with dark red longitudinal lines and spots upon the body. As they grew larger, the amount of red markings diminished and when full-fed the larvae were pale green with a faint red line down the middle of the back, flanked by two yellow lines.

The first pupa was discovered hanging from the foliage on 17th May, six more on 29th May and others at varying dates afterwards. At this time there were larvae still in their initial stages of growth to be seen on the plants. The first two moths emerged on 7th June and up to the 19th June, sixteen moths had emerged, before I passed the tray of food-plant to Brian Elliot, who also obtained a series from it.

The plants in my garden appeared to contain few larvae, for only odd ones were noted from 21st May, and the presence of dozens of black ants foraging among the plants made it seem unlikely that many would attain the perfect state. However, on 22nd July, three moths were attracted to the light from the kitchen window and others were seen on 8th, 19th and 20th August. It remains to be seen whether the moth will continue to thrive in its new habitat, but it appears to adapt quite readily, and I was pleased to see four moths in their original habitat in Sheffield, despite a considerable reduction of food-plant, on 13th August.

As a footnote, I would like to record that a fellow entomologist, Mr B. Statham, took two moths in his garden at Matlock in his m.v. trap on 20th July and no less than twelve on 22nd July.—F. HARRISON, 24 Church Street, Holloway, nr. Matlock, Derbys. 26.ix.1972.

PALPITA UNIONALIS HUBN AT PORTLAND.—Among more than one hundred visitors to my moth trap in the garden of the Pennsylvania Castle Hotel on October 7th 1972, was a specimen of the beautiful white *Pyrale*, the Scarce Olive Tree Pearl. One of the few migrants seen this year, and one which has been unusually scarce since the period in the 1950's when it was reasonably numerous, usually in the autumn. Perhaps it is returning and on the up-grade.—C. G. M. DE WORMS, Three Oaks, Woking. 22.x.1972.

CIRRHA OCELLARIS BORKH. AT WOKING. — On October 12, 1972, I was surprised to find in my m.v. trap here, a somewhat worn specimen of the Pale Lemon Sallow which has not honoured me before. This insect seems to be spreading appreciably, mainly along the southern side of the Thames basin in Kent, Surrey and Bucks, possibly with the growth of large poplars, which in some localities have been cut or lopped, thus depriving the trees of catkins in which the larvae start their feeding cycle. This has been so in this neighbourhood, especially near Weybridge and Chertsey where the species has been almost eliminated in recent years. — C. G. M. DE WORMS, Three Oaks, Woking. 22.x.1972.

THE DECLINE AND FALL OF SUGARING. — From my earliest days, sugaring for moths has always held a great fascination for me, mainly I suppose because in those early years, it was one of the most productive methods, in fact the sugaring tin has been the main means of enabling me to fill several drawers of my cabinets.

In the palmy days of the nineteen thirties and forties, I had a fair sized garden abutting the racecourse and entomologically it was very prolific; in the twenty odd years there I recorded well over 200 species of moths, and 18 of the butterflies.

Sugaring the trees in the garden was great fun; on odd occasions when I had left the anointing process rather late, the moths were waiting for me when I went into the garden, flying round my head; they settled on the trees while I was painting them and some even settled on the brush. Alas, those days are now over.

As a matter of interest, in 1938 I had a holiday at Scarborough in the middle of October. During the week or so I sugared a number of trees on Olivers Mount, and the results were surprising; I could easily have collected a couple of hundred in an evening; *exsoleta* by the dozen, also *macilenta*, *vaccinii* and *ligula*, while *circellaris* was in profusion; I wonder what the bag would be today.

I don't think the decline in the moth harvest is due to its lack of attraction, but simply because the moths are not there to be attracted; at any rate this has been my experience.—L. G. F. WADDINGTON, 9 Greenleafe Ave., Wheatley Hills, Doncaster, Yorks. 13.viii.1972.

EUPHYDRYAS AURINIA ROTT. IN SOUTH EAST ENGLAND.—I have to report the probable destruction of yet another locality for the Marsh fritillary *Euphydryas aurinia* Rott. This butterfly thrived on a small piece of rough ground near Guildford in Surrey; but on inspection of the site on suitable days in late May and early June this year no *aurinia* were seen, and I was horrified to discover that the whole area had been ravaged by a fairly recent fire. On enquiry from local people this fire seems to have occurred in mid April—just when the larvae would have been at their most vulnerable to this hazard.

This is the third *aurinia* locality I know that has been lost in the South East over the last four years. Dichling Common was ploughed up in 1969, and last year a piece of heathland on the edge of Woolmer Forest where the Marsh Fritillary occurred was burnt by a misguided Botanist. I understand *E. aurinia* is still reported from the Dunsfold area, but I personally have not met with it there since a woodland habitat was destroyed by the Forestry Commission several years ago.

This butterfly has always been of particular interest to me, and I know many of its colonies from Argyll in Scotland (where it is widespread), through Cumberland, down to Dorset, Devon and Cornwall in the south; but in Surrey, Sussex and East Hants., I suspect that *aurinia* colonies are now very few and far between. I would welcome any news of this butterfly in these counties and urge that the attention of the respective County Naturalist Trusts be drawn to any remaining localities.

Incidentally in this aberrant season I saw fresh *aurinia* on the wing in South Devon on July the first.—Dr C. J. LUCKENS, 52 Thorold Road, Southampton, Hants., 17.x.1972.

APAMEA LATERITIA HUFN. A THIRD BRITISH RECORD. — On the morning of 18th July 1972, Bernard Skinner showed me a fine specimen of *Apamea lateritia* Hufn. which he had removed from his m.v. trap a few hours earlier; this was the second British specimen.

The following morning, when going through the contents of my garden trap, I was astonished to see a specimen of *lateritia* on the very last piece of egg carton in the trap. I boxed the moth without difficulty, and as it seemed settled, lifted the box to have a closer look at my prize through the open end of the box. This was a fatal mistake, for within a few seconds, it suddenly turned and bolted and was not seen again, although I ran two additional m.v. lights in the vicinity of my garden the following night in the hope of re-tapping it.

Whilst I am loth to record "the one that got away" I feel that the occurrence of such a rare migrant should not go without notice. I have no doubt whatever about the identity of the moth, having carefully examined the example taken by Mr Skinner the previous day.—D. O'KEEFFE, 51 Parkhill Road, Bexley, Kent. 12.x.1972.

CELERIO GALII ROTT. IN KENT.—On the night of 27th July, 1972, a female specimen of *Celerio galii* Rott. entered the m.v. trap in my garden at Sevenoaks, Kent. The moth readily produced about 300 ova, most of which were successfully reared on *Epilobium* to the pupal state. All observations relating to development and habits compared pretty well with Hugh Newman's account in his book "Hawk Moths of Great Britain and Europe", but a few points were omitted which may interest readers. In about 30 per cent of cases the larvae changed from green to black or dark grey at the first moult. Of the remainder, about 30 per cent changed to the darker forms at the second moult, the balance remaining various shades of olive green until pupation.

The fully fed larvae, when provoked, occasionally emit from the moth a thick, green, pungent fluid. I once saw my cat effectively repelled by this when sniffing around an escapee from one of my cages.

I have not yet made any effort to force any emergences, which I understand to be the only way of ensuring emergence when rearing this species in this country. — J. L. DYER, 7 Prospect Road, Sevenoaks, Kent. 20.x.1972.

PAMMENE HERRICHIANA HEIN. (LEP. TORTRICOIDEA) IN KENT AND MONMOUTHSHIRE.—I have only ever taken two specimens of this moth. One was at St. Arvens, Monmouthshire on 13th June 1970; and the other occurred to me on the afternoon of 29th May this year as it fluttered down to rest on the bare chalk of a down adjoining a beech wood at Halling, Kent.—J. M. CHALMERS-HUNT. 1.ix.1972.

CELERIO GALII ROTT. LARVAE IN N. LANCASHIRE. — On 20th September, 1972, while searching for Pug larvae on the limestone slopes overlooking Leighton Moss near Silverdale in Morecambe Bay, Lancashire, in company with Mr Arthur Watson of St Annes-on-Sea, we found two nearly full grown larvae of *Celerio galii* Rott. They were feeding in the mid-day sunshine on the young seed pods of *Galium verum* and were very conspicuous with their shiny blue-black ground colour, and rows of creamy-white spots. This was in direct contrast to the five full grown *galii* larvae I found in 1958 in Bradford, Yorkshire, which were an olive-green colour with pinkish undersides, and creamy-white spots rendering them much less conspicuous on their foodplant *Epilobium angustifolium*.—J. BRIGGS, Frimley House, Deepdale Close, Beetham, Nr. Milnthorpe, Westmorland. 31.10.72.

LITHOSIA QUADRA L. IN WESTMORLAND.—While checking the moths sitting on the house wall near the M.V. trap, at approx. 3.30 a.m. B.S.T., 20th August 1972, I found a large male specimen of *Lithosia quadra* in immaculate condition.—J. BRIGGS, Deepdale Close, Beetham, Nr. Milnthorpe, Westmorland. 31.10.72.

Obituary

DENNIS ALFRED SMITH, F.R.E.S.

The premature death of Dennis Alfred Smith, which took place on July 7th of this year, after a long illness at the early age of 59, has deprived British Entomology of a promising figure, and probably of a quantity of original research. Dennis had built up a very large business as an estate agent and property developer; six years ago it was the biggest one man business of its kind in Essex. Some four years back he was warned by his doctor that he was overworking, so he amalgamated his business with several other firms and arranged to retire altogether at 60 and devote the rest of his life to the study of Western European lepidoptera.

This was not to be; three years ago he had a stroke which was followed by two others, of which the last proved fatal. It was found after his death that there had been no cerebral haemorrhage at all, but from overwork and lack of exercise, his arteries were in a condition that would have been poor in a man of ninety.

Dennis was not only an enthusiastic entomologist, but a very shrewd and helpful friend. About 1950 I introduced him to the late Dr Cockayne, who took to him at once (not always the case with E. A. C.). As both Cockayne's executors and trustees, the late Marquis of Aberdeen and the late Dr H. B. Williams Q.C., were getting on in years, Cockayne appointed Dennis as a third, and he subsequently became one of the managers of the Cockayne Fund.

Dennis wrote very little, as he was always waiting until he was free to go about as he liked, though he corresponded with and met Horatio Querci and several European collectors. He collected in Spain, Marjorca, Corsica and Positano and other parts of Italy, and his wife and he made a foursome with my wife and myself to Western Ireland in 1948; when it rained every day!

I once reckoned that he was busy about 18 hours a day; he was most kindhearted, and his active help was sought by and given to far too many local institutions. He was a co-opted member of the Southend Corporation Education and Library committees, of the Beecroft Art Gallery Committee, and many others, and in addition, he was the wittiest after-dinner speaker the writer has ever heard.

Some little time back, when he found his hands were so bad that he could no longer manipulate a pair of forceps, he disposed of all his library and specimens, including a very fine series of foreign Papilio and Ornithoptera.

He is survived by his wife, Kathleen, to whom our sympathy is offered.—H. C. H.

Current Literature

Army Ants—A Study in Social Organisation by T. C. Schneilda, edited by Howard R. Topoff. W. H. Freeman and Co., San Francisco, 1971. \$12.00, pp. xx+349. 8 coloured plates.

Twenty or so years ago Crompton was able to write in his *Ways of the Ant*, "Observation is for ever toiling wearily after classification, and nowhere is observation so far behind as in the case of the sub-family Dorylinae." Thanks to the work of the late Dr Schneirla this is no longer the case. From the 1930's until his death in 1968 he published many papers on the biology of the army ants and this book is a synthesis of his work.

Following a short introduction and keys to the genera of the Dorylinae, the succeeding chapters deal with varying aspects of the biology of the army ants. The founding of temporary nesting sites ('bivouacs'), raiding and the mass emigrations to new nesting sites are vividly described and differences in behaviour between genera shown. Further chapters describe the raising of the brood, the functions of the sexual forms, colony foundation and other aspects of their nomadic life. The book is concluded by a short glossary and a useful list of references.

This book is written in a scholarly but readable fashion and adds much to the information available on these fascinating insects. Many text figures increase the value of the book. My one disappointment is the quality of reproduction of photographs. The colour plates are fair, but the reproduction of many of the plentiful black and white photographs is so poor as to make them meaningless. The legend to figure 8.2, p. 171 appears to have been reversed. These minor faults apart, this book will remain a classic on its subject for many years to come and is recommended to all who are interested in the social insects.—P.A.B.

The Butterflies of the Maltese Islands by Anthony Valletta, F.R.E.S. 64 pp. + 17 pl., 8vo, 35p. E. W. Classey.

Now that Malta has been brought well within the "summer holiday range" this little book will be of interest to all visitors to the Maltese Islands who have a liking for nature. The writer is a collector of many years' standing and he has written in a style simple enough to permit the novice to understand without being confused by scientific jargon, but also giving detail enough for the collector or entomologist to use the book as a guide to what he should expect to find.

Twenty-three species are dealt with and are illustrated by half tone plates. The species are given their vernacular names on the plates, but the scientific names have been added where the species are dealt with in the text.

Mr Valletta is interested in all branches of natural history, and has produced booklets on the birds, trees and wild flowers of the Maltese Islands. — S.N.A.J.



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"Coleoptera of Sussex—I am at present revising the Victoria County History of Sussex list of Coleoptera (published in 1905, compiled by W. W. Fowler). I would be most grateful if any readers having records of Coleoptera from Sussex (vice counties 13 & 14) would contact me. Records of rare and common species are needed. It is hoped that a revised list will be published in the not too distant future."—J. Cooter, 174 Seaforth Gardens, Stoneleigh, Ewell, Epsom, Surrey.

Hertfordshire Ants—Would any readers having records or sightings of ants of any species in Hertfordshire kindly send an indication of species, date and grid reference plus any locality details, to the address below, to help with a survey currently being undertaken.—P. J. Attewell and S. D. Mackey, 69 Thornbury Gardens, Borehamwood, Herts.

WANTED—Mahogany butterfly cabinet, about 20 drawers. Brady or similar quality.—R. Fairclough, Blencathra, Deanoak Lane, Leigh, Reigate, Surrey.

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